International Journal of Scientific Research and Management Studies (IJSRMS)
ISSN: 2349-3771 **Volume 3 Issue 5, pg: 210-215**

DIRECTION FOR BLIND PERSON USING GPS NAVIGATOR

Istuti Nirmal Saxena[1], Mansi Vashisht[2], Jyoti[1], Kalpana Singh[1],
Harshita Tyagi[1], Divya Saxena[1]
[1]Assistant Professor, [2]U.G. Scholars, Deptt. of E&C Engg. , MIT Moradabad,
Ram Ganga Vihar, Phase-II, Moradabad (244001), India.

ABSTRACT

As the technology is advancing day to day, the human machine interaction has become a must in our daily life. The primary objective of this work is to permit blind persons to explore autonomously in the outside environment. The proposed work is to use a stick including a GPS Navigator. Now a days a stick are used with some features but in our project we are using GPS module with some other advance features. This work goes for giving the route to blind person by designing a cost effective and more flexible navigation system. The proposed system consists of hardware and software. Here the components we are using are Microcontroller, Transformer, GPS module, etc. This project will help the blind people in improving their communication ability and not to depend on none during walking in even unknown areas.

KEYWORDS: *Microcontroller, IR Sensor, Label Sensor, Global Position System, MAX232, Power Supply.*

I. INTRODUCTION

The goal of this work is to allow the visually impaired persons navigate independently in the environment. This paper presents a various things which are implemented for visually compared person. In this paper we discussed through various researches what development has been done on visually impaired person and our proposed work regarding the following paper. Department of Electronics and Communication Engineering MIT Moradabad.

II. LITERATURE SURVEY

[1] DR BOYINA.S.RAO: This paper presents the architecture as well as the implementation of the system that helps the visually impaired person to navigate autonomously in the indoor environment. This method utilizes the Global Positioning System (GPS) and it also incorporates object avoidance technologies. The system applies a ZigBee protocol to provide the continuous tracking of the visually impaired person. It also consists of additional components like ATMEGA microcontroller, ultrasonic sensor and microphone to provide more refined location and orientation information. 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 and then transferred to the PC using the ZigBee transceivers, using these values the localization of the visually impaired person is attained using Google map. The goal of this work is to allow the visually impaired persons navigate independently in the indoor environment. Conventional navigational systems in the indoor environment are expensive and its manufacturing is time consuming. The visually impaired are at considerable disadvantage as they often lack the information needed while passing obstacles and hazards. They have relatively little information about land marks, heading and self-velocity information that is essential to navigate them successfully through unfamiliar environments. In this modern world providing security to each and every human being in life gains a major consideration. Everyone has realized the need to secure themselves against hazards and unauthorized dealings. This

work aims at providing the navigation for the visually impaired persons, by designing a cost – effective and more flexible navigation system. It is our belief that the recent advances in technologies could help and facilitate in day – day operations of visually impaired persons.

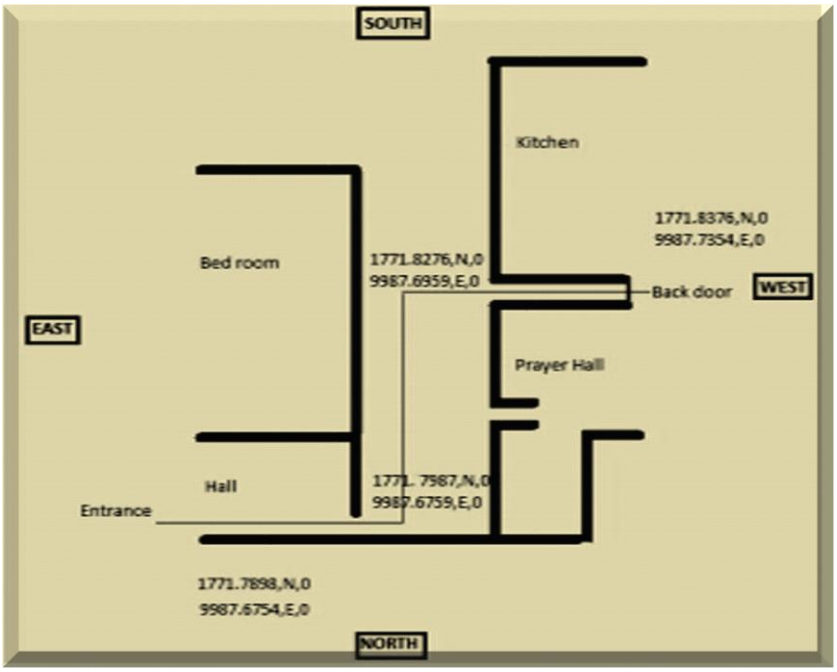

Fig 2.1: General block diagram (Tx and Rx section)

[2]CHAITALI K. LAKDE: Traditionally white cane is the most popular, simplest tool for detecting obstacles due to its low cost, portability. It enables user to effectively scan the area in front and detect obstacles on the ground like holes, steps, walls, uneven surfaces, downstairs etc. But it can only be used to detect obstacles up to knee-level. Its detection range is limited up to 1-2 feet only. Certain obstacles (e.g. protruding window panes, raised platforms, a moving vehicle, and horizontal bars) cannot be detected till they are dangerously close to the person. Even dog guides are very capable to guide these persons but they are unable to detect potentially hazardous obstacles at head level. Guide dog service stage is on average 6 years and requires regular dog up-keeping expenditure and lifestyle changes. Present Solutions on Above Problems Several solutions have been proposed in the recent years to increase the mobility and safety of visually impaired persons. A system "Roshni" determines the user's position in the building, navigation via audio messages by pressing keys on the mobile unit. It uses sonar technology to identify the position of user by mounting ultrasonic modules on ceiling at regular intervals. This system is portable, easy to operate and is not affected by environmental changes. But this system is limited only for indoor navigation because it requires detailed interior map of the building. RFID based map-reading system which provides technical solution for the visually impaired to pass through public locations easily using RFID tag grid, RFID cane Reader, Bluetooth interface and personal digital assistance. But its initial development cost is quite high and chances of interference in heavy traffic.

A voice operated outdoor navigation system developed using GPS, voice and ultrasonic sensor. It can alert user's current position and provide verbal guidelines for travelling to a remote destination but fails to give obstacle detection and warning alert.

[3] PRANJALI R PHIRKE: she has design a device which is named as Location Finding for Blind People Using Voice Navigation Stick The paper main objective is to provide a talkative assistance to blind people. We are going to develop an intelligent system that works efficiently well 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. The device is used to help blind people to move with

the same ease and confidence as a sighted people. 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. A RFID can be installed into public building and it is also integrated into blind persons walking stick .The whole device is designed to be small and is used in conjunction with the white cane.

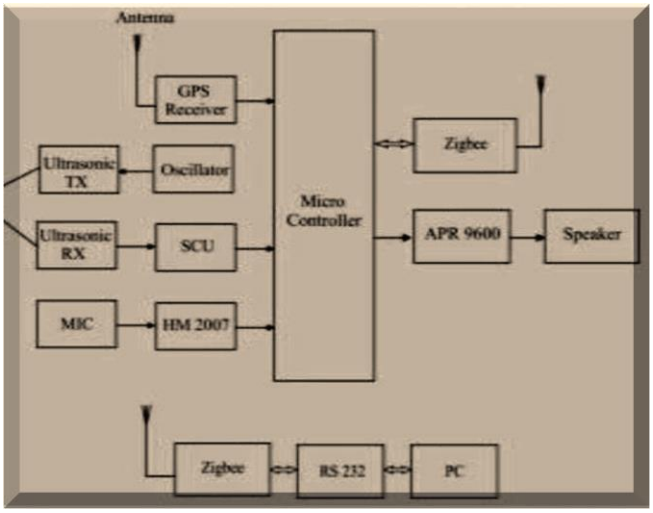

Fig 2.2: GPS Component

An attempt has been made to make a compact and portable device which is exclusively designed for visually impaired people. It will allow the visually impaired person to travel through an unfamiliar environment with ease. It can be said that the project provides Silicon Eye for visually impaired people. The design and architecture of a new concept of Smart Electronic Travel Aid Stick for blind people. The advantage of the system lies in the fact that it can prove to be a very low cost solution to millions of blind persons worldwide. The proposed combination of various working units makes a real-time system that monitors position of the user and provides dual feedback making navigation more safe and secure. This system is intended to provide overall measures object detection and real-time assistance via Global Positioning System (GPS).The system consist of ultrasonic sensor, sonar sensors, GPS Module, GSM Module and vibratory circuit (speakers or head phones). When the object is detected near to the blinds stick it alerts them with the help of vibratory circuit (speakers or head phones). The location of the blind is found using Global System for Mobile communications (GSM) and Global Position System.

[4]HARSHA GAWARI: There are many systems which are designed to help navigate the visually impaired. SWAN (System for Wearable Audio Navigation) consists of a laptop, a tracking chip, GPS sensors, 4 cameras and headphones. The sensors and tracking chip send data to the laptop having the SWAN application which then computes the location and the direction where the blind person is looking. A travel route is mapped and 3D audio cues are sent to the head phones to guide the person along a path to the destination. The disadvantage of this system is that it needs many sensors,4 cameras that makes the system complex and expensive. Another system called SESAMONET (Secure and Safe Mobility Network) uses RFID microchips which are embedded in the ground.

This is used to guide the visually impaired through a predefined area. Each microchip sends position signals through a walking stick to the smart phone. The disadvantage of this system is that it requires many RFID microchips and it is not possible to put so many chips for long distance. Hence the system is expensive. The system explained here provides the details to the users regarding where at present he/she is located and spoken directions to travel to a remote destination. The visually impaired often lack the needed information for bypassing obstacles and hazards and have relatively little information about landmarks, heading, and self-velocity. This puts them into considerable disadvantage compared to sighted individuals navigating through familiar environments who have knowledge of these environments or who are navigating through unfamiliar environments on the basis of external maps and verbal directions to make a navigation system use friendly and accessible to the greatest proportion of vision impaired people, usability is a key focus of the project, and speech technology

was identified as a priority feature of the system. Further, by replacing the Braille keyboard with a speech technology, the device will be more portable and less cumbersome to use while walking. Speech technology has been under development for more than three decades.

[5] ABDEL ILAH NOUR ALSHBATAT: The system is Automated Mobility and Orientation System for Blind or Partially Sighted People Currently, blind people use a traditional cane as a tool for directing them when they move from one place to another. Although, the traditional cane is the most widespread means that is used today by the visually impaired people, it could not help them to detect dangers from all levels of obstacles. In this context, we propose a new intelligent system for guiding individuals who are blind or partially sighted. The system is used to enable blind people to move with the same ease and confidence as a sighted people. The system is linked with a GSM-GPS module to pin-point the location of the blind person and to establish a two way communication path in a wireless fashion. Moreover, it provides the direction information as well as information to avoid obstacles based on ultrasonic sensors. A beeper, an accelerometer sensor and vibrator are also added to the system. The whole system is designed to be small, light and is used in conjunction with the white cane. The results have shown that the blinds that used this system could move independently and safely.

III. PROPOSED WORK

We have concluded from above discussion that we can use a stick including GPS Navigator. We can also use sensor like IR proximity sensor for object sensing and provide proper path for walking.We use label sensor for object deep and stair places that provide proper path for walking. Here we use Panic Switch in case of critical condition for visually impaired people.

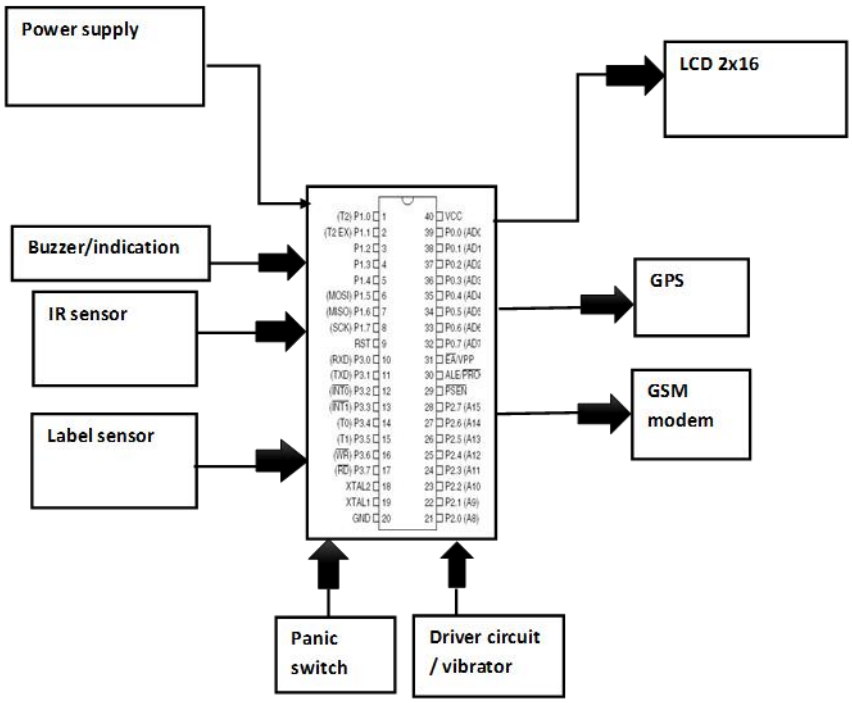

FIG 3.1: Block diagram of direction of blind person using GPS Navigator.

This system (GPS) has become very important for worldwide navigation and it is useful for tracking, surveillance, way and map marking, and much more. A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone.

IV. TABLE FOR RESULTS AND DISCUSSION

S.NO.	PAPER	ADVANTAGES	DISADVANTAGES
1.	DR BOYINA.S.RAO	Providing security to each and every human being in life	Unsuccessful to implement.
2.	CHAITALI K. LAKDE	It can alert user's current position and provide verbal guidelines for travelling to a remote destination	Fails to give obstacle detection and warning alert
3.	PRANJALI R PHIRKE	The proposed combination of various working units makes a real-time system that monitors position of the user	Unsuccessful to implement.
4.	HARSHA GAWARI	A travel route is mapped and 3D audio cues are sent to the head phones to guide the person along a path to the destination.	It requires many RFID micro-chips and it is not possible to put so many chips for long distance. Hence the system is expensive.
5.	ABDEL ILAH NOUR ALSHBATAT	Detect dangers from all levels of obstacles	Fails to find exact location

V. FUTURE SCOPE

- This project can be extended by incorporating a GPS module.
- We can interface this module to send message to be near and dear once of the blind person regarding his/her current position.
- During so, we can track the moment of the blind person in a very efficient manner.

VI. CONCLUSION

The proposed work has the scope of widespread in indoor and outdoor application. The stick we used in our project is easy to use by visually impaired people. It has a wide use in future. The project demonstrate a proper working and complete character.

REFERENCES

[1]Dr Boyina.S.Rao"Blind Assistant Navigation System" in IEEE Transactions, March 2011. Ulrich and J. Borenstein, "The GuideCane — Applying Mobile Robot Technologies to Assist the Visually Impaired" in IEEE Transactions on Systems, Man, and Cybernetics, —Part A: Systems and Humans, Vol. 31, No. 2, March 2001, pp. 131-136.
[2]Chaitali K. LakdeB. B. Blasch, W. R. Wiener, and R. L. Welsh, Foundations of Orientation and Mobility, 2nd ed. New York: AFB Press, 1997.
[3] Pranjali R Phirke.Alshbatat, Abdel Ilah Nour. "Automated Mobility and Orientation System for Blind or Partially." International Journal on Smart Sensing and Intelligent Systems, 568-582, 2013.
[4]Harsha Gawari Somnath Koley, Ravi Mishra, "Voice Operated Outdoor Navigation System for Visually Impaired Persons", International Journal of Engineering Trends and Technology- Volume3Issue2- 2012
[5] Abdel Ilah Nour AlshbatatChaudhry M., Kamran M., Afzal S., "Speaking monuments — design and implementation of an RFID based blind friendly environment." Electrical Engineering, 2008. ICEE 2008. Second International Conference on 25-26 March 2008 Page(s):1 – 6.
[6] Roshni: Indoor Navigation System for Visually Impaired by D.Jain and M.Balakrishnan, P.V.M.Rao.
[7] P.Dharani, B.Lipson and D.Thomas, "RFID Navigation System for the Visually Impaired", Worcester Polytechnic Institute, 2012.
[8] S.Koley and R.Mishra, "Voice operated outdoor navigation system for visually impaired persons", International Journal of Engineering Trends and Technologyvol. 3, issue2- 2012.
[9] R. Tapu, B. Mocanu, T. Zaharia "Real time static/dynamic obstacle detection for visually impaired persons" IEEE International Conference on consumer electronics (ICCE),978-1-4799-2191- 9/14, pp. 394-395,2014.

Z. Hunaiti, V, Garaj, W. Balachandran, F. Cecelja, "An Assessment of 3G link in a Navigation Systems for Visually Impaired Pedestrians", Proceedings of the 15th International Conference on Electronics, Communications and Computers, 2005,pp. 180-186.
[10] Lisa Ran, Sumi Helal and Steve Moore, "Drishti: An Integrated Indoor/Outdoor Blind Navigation System and Service", Proceedings of the Second IEEE Annual Conference on Pervasive Computing and Communications 2004 IEEE.

AUTHOR

Istuti Nirmal Saxenais a final year undergraduate scholar, Department of Electronics and Communication Engineering from Moradabad Institute of Technology, Moradabad (U.P.). Main area of interest is Embedded System.

Mansi Vashisht (B.Tech, M.Tech pursuing) Assistant Professor ECE Department.

Jyoti is a final year undergraduate scholar, Department of Electronics and Communication Engineering from Moradabad Institute of Technology, Moradabad (U.P.). Main area of interest is Embedded System.

Kalpana Singh is a final year undergraduate scholar, Department of Electronics and Communication Engineering from Moradabad Institute of Technology, Moradabad (U.P.). Main area of interest is Embedded System.

Harshita Tyagi is a final year undergraduate scholar, Department Of Electronics and Communication Engineering from Moradabad Institute of Technology, Moradabad (U.P.). Main area of interest is Embedded System.

Divya Saxena is a final year undergraduate scholar, Department Of Electronics and Communication Engineering from Moradabad Institute of Technology, Moradabad (U.P.). Main area of interest is Embedded System.