



ULTRASONIC BLINDSTICK WITH GPS TRACKING

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Abstract—The innovative Blind stick system is capable of operating in user friendly manner, so that the blind person can walk independently without getting help from others. This system assists the blind to navigate on their own . in case of emergency situations such as high traffic density the location of the member is shared to the family members The prototype model consists of a stick and a hand cuff within built pulse detector. The stick with sensors deployed can detect the obstacles in front with sensors and it will produce various buzzer sounds depending upon the direction. The buzzer would alert the user. Furthermore, the Sensors on stick can detect the water and fire on ground and informed to the person by buzzer. The hand cuff is equipped with in built GPS , GSM and pulse detector equipments , so that if the member pulse falls below a threshold level then his location will be shared to his family. By trial and error method the system can detect obstacles such as pedestrians, objects , water and heat with greater accuracy

Keywords—Blind Assistance, Sensors, Buzzers, Embedded C, MPLAB

I.INTRODUCTION

The survey conducted by World Health Organization in 2017 estimates that there are 327 billion people in world with visual impairment, 36 billion of people are blind and 258 billion are with low vision, and around 24 million people are blind in India,. This system designs and develops a portable unit (stick) for the blind people for easy navigation in all places. The stick with long cane structure with some alteration at hand cuff parameter is used because it can feel the path nature and detect obstacles in the path of the blind person. Being an emerging area of research, a review of the

most recent literature has been carried out and presented below.

II. OBJECTIVE OF WORK

The main aim of our project is to provide assistance visually challenged people without depending on others, so that they can navigate with ease using advance technology. In this technology controlled world, people will like to live independently, this project suggests that an innovative stick with all integrated facilities for blind people, help them gain personal confidence. Since this is very nominal and not bulky, one can make use of it very easily. The paper describes ultrasonic blind stick with GPS tracking system. The aim of this paper is to help visually impaired people using a stick to find out if any obstacles are present in front of them. The ultrasonic blind walking stick is way more advanced than the traditional walking stick as the use of sensors makes object detection easier. GPS gives the latitude and longitude by which current location can be traced. One of the most advanced feature is that suppose if the blind forgets the stick, they can easily identify by pressing wireless RF based remote which is connected to their hand cuff used for finding the lost stick by pressing the remote button

and buzzer sounds from the stick. Thus the system can detect obstacle as well as finding stick if it is misplaced by the person. It also has a special feature called pulse detection.

III. SYSTEM ANALYSIS

➤ EXISTING SYSTEM

- i. In the existing system the blind people are guided by just a stick which they tap on the floor as they walk.
- ii. If there is any water in front of the person it cannot be detected by just the tap and the person steps on the water and may slip and fall.
- iii. the blind person is guided by trained dogs to know their surrounding
- iv. cane provides the assistance for the blind. the device is totally operated with spring mechanical suspension to detect obstacles on the ground, unbound surfaces, pit holes, steps with varying slopes

- v. The trained persons with cane operation are required to give training for blind persons which will generally take more days or even months to acquire that skill.
- vi. Dogs are easily trained as per the requirements of man, so blind person adapts them to a trained dog for navigation and other requirements, but it has some risk factors in terms of dogs attitude to different environment
- vii. Since most of the blind person are elderly in nature, threat to them are more so security measures are not up to the level in existing system.

➤ **DISADVANTAGE OF EXISTING SYSTEM**

- i. Lack of reliability
- ii. Cannot sense all types of environment.
- iii. Not suitable for detecting dangerous obstacles
- iv. Lack of stability.

➤ **PROPOSED SYSTEM**

There are two units present one in the walking stick which is the receiver/transmitter unit and the transmitter unit that is placed on the person's hand.

- i. Ultra sonic sensor is used to identify the obstacle and to inform the blind person.
- ii. Same as fire and water sensor is used sense and inform the person about the fire and water on ground
- iii. RF transmitter is fitted to blind person if he miss the stick, then sound is produced by buzzer with switch and RF receiver.
- iv. In built GSM and GPS combinations are used to send the location(arena) of disabled person to friends and family.
- v. It also has a special feature called pulse detection which is used to detect the visually challenged persons pulse if it goes high or low.

➤ **ADVANTAGES OF PROPOSED SYSTEM**

- i. Stability
- ii. High safe and security.
- iii. User friendly.
- iv. Low cost.

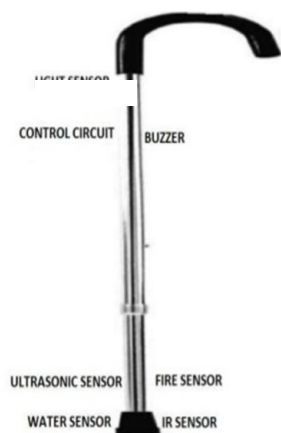


Fig 1 : Proposed work

IV.SYSTEM DESIGN

➤ PIC16F877A MICROCONTROLLER

This microcontroller used in our system is PICF877 Which has Serial Peripheral Interface , 8 channels of 10-bit Analog-to-Digital (A/D) converter, the 2-wire Inter-Integrated Circuit and an universal asynchronous receiver transmitter (USART)



Fig.2 : PIC16F877A MC

➤ GSM

In our project we use GSM for transmitting and receiving data using text message, since GSM is an open, digital cellular technology used for transmitting mobile voice and Data, we have placed this module in the stick , when the blind person pulse has below a threshold value then using this module text messages are communicated to his family member



Fig.3 GSM (Global System for Mobile communication)

➤ **GPS**

GPS stands for Global Positioning System .Its is used for navigational purpose



Fig.4 GPS (Global Positioning System)

➤ **ULTRASONIC SENSOR**

Ultrasonic Sensor is a type of sensor that uses sound waves to detect an obstacle. In this project we use ultrasonic transceiver which transmits and receives sound waves depending upon the waves received it will calculate the distance and send the data to microcontrollers and various buzzer sounds are produced depending upon the distance of objects



➤ **WATER SENSOR**

Detects the presence of water and moisture



Fig.5 WATER SENSOR

V. SYSTEM DESCRIPTION

In our project we have designed the cane structure in a compact manner with all the modules interconnected in simple wires, the cane provides the assistance for the blind the device is totally operated with spring mechanical suspension to detect obstacles

on the ground, unbound surfaces, pit holes, steps with varying slopes. Various technology have been emerged but still now cane with enclosed cuff is designed , normally this cuff is easily wearable it resembles like a bracelet and it This system has been designed to send SMS for registered mobile phone in case of emergency situations and the system does it by transmitting its current coordinates in the form of Latitude and Longitude using a reply SMS to same mobile phone. The ultrasonic sensors are used to detect any obstacles in front of the visually challenged person and it will also alert the visually challenged person using a buzzer which is attached to the system. The water sensor which is present in the system is used to detect water when the visually challenged person dips the blind stick in a water stagnated area, he gets the alert through the buzzer which is connected to the system. The fire sensor which is present in the system is used to detect the heat when the visually challenged person enters into a firing area. This system consist of a switch which is used to find the stick if the visually challenged person misplaces the stick. The system also consist of another switch which is used to send the present location of the visually challenged person to his fellow members if he needs a guide to reach his destination. It also has a special feature called pulse

detection. Which is used to detect the visually challenged persons pulse if it goes high or low. This information is sent as SMS to the persons relatives through the GPS and GSM terminals.



Fig.4 snapshot of the completed proposed work

VI. CONCLUSION

The designed prototype model can able to detect the obstacle in the straight path, right angle path and the curved path. At least 1m width is required for the proper management of the stick. The broad beam angle ultrasonic sensors enable wide range obstacle information. Major drawback of infrared sensors is their non-linear response i.e. a big change in output voltage does not always indicate a big change in range. apart from these user is guided for clear path by considering various environmental factors such as rain , mist etc. With the help of this stick blind, people can improve more than 25-40% travel speed,

that will reduce collision between them, and it provides increase safety as compared to unaided equipments

All the concepts of the proposed system were checked for their output and proper functioning. Using this technology we can help the blind people navigate safely and freely without any accidents.

VIII. FUTURE WORK

Future work includes installation of additional sensors like accelerometers, PIR motion detector and the cane can be replaced by robotic arm which guides the user

IX. ACKNOWLEDGEMENT

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