Abstract:
Blindness is a condition of lacking visual perception due to physiological or neurological factors. Blind people face many problems in everyday life. They always depend on others. These visually impaired people face the problems of orientation and mobility. One of the solutions to this problem is “Smart Shoes for Blind” which facilitate safe navigation for blind people. The proposed system is ATmega328 microcontroller based which has features like obstacle detection, navigation through voice command that provides a complete guideline to assist a visually impaired person reaching any destination safely.

Keywords: navigation, obstacle detection, ultrasonic sensor.

I. INTRODUCTION

Blindness is a condition of lacking visual perception due to physiological or neurological factors. Blind people always depend on others and are derived from performing daily activities. They can’t move easily from one place to another without help. It is very difficult for blind people to navigate safely with the help of stick only. Thus proposed system is the solution designed and developed to facilitate safe navigation for blind people. The proposed system is ATmega328 microcontroller based which has features like obstacle detection, navigation through voice command that provides a complete guideline to assist a visually impaired person reaching any destination safely. The proposed system is facilitated with panic button. It acts as SOS i.e. it will send present location of user to his friend or relative.

II. PROBLEM STATEMENT

Low vision people face various problems every day, with only the stick in their hand it is very difficult for them to walk or to travel. They face following problems:

- Dependency
  Blind people have to be dependent on someone every time they walk or travel.

- Inability
  They don’t know what might come up their way suddenly and might get hurt.

- Insecurity
  While in crowded they have to be very careful about their surroundings they might lose their valuable things.

III. REVIEW OF LITERATURE

A significant number of works have been done for blind people, so that blind person can easily move one place to another without being burden of others. But there is no completed work together. It means that, if one work is done for GPS navigation other is for obstacle detection. So, the work is discrete not integrated. This is why a blind person does not get proper guideline to go his willing place without facing any obstacle.

It addresses a prototype, smart rehabilitative shoes and spectacles, designed and developed to facilitate safe navigation and mobility of blind individuals. Each shoe is mounted with three pairs of ultrasonic transducers placed on the medial, central, and lateral aspects of the toe cap so as to detect ground-level obstacles of different heights as well as ground pits and holes. The corresponding tactile outputs are provided by three miniature-sized vibrating motors embedded within the collar of the shoe. The spectacles are instrumented with a pair of ultrasonic transducers mounted centrally above the bridge, and with a buzzer at one of the temples. They are used to detect obstacles at head level. The developed shoes and spectacles are controlled via a battery-operated, microcontroller-based belt pack unit. The developed system has been subjected to several validation tests. [1]

The system includes two modules: one is providing direction and another is obstacle detection. The system shows direction via smart phone using voice command and to detect any obstacle on the way, ultrasonic sensor is used. When a blind person gives destination location as input via voice, the system finds the shortest path between source and destination using Dijkstra’s algorithm. Simultaneously if any obstacle is detected by ultrasonic sensor, distance of the obstacle is calculated through microcontroller. Then the data is sent to smart phone using Bluetooth module and converted into voice which is heard by the blind person. In brief, it is a system which provides a complete guideline to assist a visually impaired person reaching any destination safely.[2]

Arduino Lilypad shoes are intended primarily to assist blind people to reach their destination and also help them to avoid walking into things on their way. It consists of a pair of shoes in which one is fitted with vibrators, proximity sensors and a bluetooth pad. These devices are connected to an android mobile phone that calculates directions and real time location using Google maps, built-in GPS and compass module. In arduino Lilypad, proximity sensors are used to detect the obstructers in the way of visually challenged people. So this arduino Lilypad device offers a non-obtrusive navigation for these people. A voice recognizable technique is used to know the desired destination of the blind people. A bluetooth device sends signal to the arduino Lilypad using the concept of internet of things.
IV. PROPOSED SYSTEM

The proposed system is based on ATmega 328 microcontroller. Proposed system is mounted with ultrasonic sensor so as to detect ground level obstacles of different heights and even pits and holes. The corresponding tactile outputs are provided by three miniature sized vibrating motors embedded within the system. The proposed system will connect to an application on smart phone via bluetooth module. Once user gives desired location to application via voice command, the application will give direction to user through vibrators and voice command. If obstacle is detected, buzzer will make sound depending on distance between obstacle and user.

V. CONCLUSION

The proposed system is to facilitate safe navigation and mobility of blind individuals. The proposed system i.e. smart shoes are easy to use. This system is proposed such that it complements the traditional white cane which the virtually impaired person has been using for long time. The notification of any obstacle is delivered through voice messages. The messages are made specific so the user can track the position of obstacle properly and avoid any inconvenience while walking. Thus by referring to all the points, we can conclude that “Smart Shoes” are very useful which can help blind people to navigate.[3]

VI. REFERENCE

