

Advanced Shoes For Visually Impaired

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Abstract: *The aim of this paper is to make availability for an acoustic assistance to the visually impaired people and also to deal with the problems faced by them to walk like the normal human beings. Several people not only in India but internationally too is dealing with the same issue of serious visual impairments preventing them from travelling independently. The increasing percentage of blind persons attracts the development of many assistive devices around the world. Thus, the project aims to develop a device that would serve as a guiding assistance to them. The technology proposed in the paper gives a solution for blind people. The project carries the smart shoes that guide visually-impaired people over barriers coming on their ways and could help them in walking with less collision.*

Keywords: *Obstacle detection, vibrating device for navigation, visually challenged people.*

I. INTRODUCTION

Blindness, visual impairment and vision loss have great impacts on individuals experiencing such disabilities. These carry with them psychological, social, and economic outcomes. Hence impacting the quality of life and depriving such individuals from performing many of the Activities of Daily Living, the most crucial of which is navigation and mobility. Blindness also refers to those who have so little vision that they have to rely dependent on other senses as vision substitution skills.

Blindness can be defined as the state or condition of being unable to see or perceive. It can be by birth, injury or some disease. Such disability poses great challenges in the person's day to day activities. It hinders speed as well as productivity. While the existing practise of using a white cane or walking stick is common for detection of obstacles/objects in front of the user, it does not aid in navigation through unknown or new places. There exist devices which help such visually challenged people to navigate but do not provide solutions to detect obstacles or vice-versa. Hence, the existing products

offer a solution to either of the two problems viz. obstacle detection or navigation that too at cost that not many can afford. Visually Impaired persons requires continuous assistance of other people for their mobility which makes them largely dependent on others for their social life. Traditional Guide tools were available such as white canes and guide dogs; both are limited and have many disadvantages. With the advancement in technology, Electronic Navigational aids were developed for the benefit of visually impaired, extensive research has been done on various types of navigational devices using different methods and technologies, such as GPS, Computer vision, ultrasonic (US) etc. GPS based Navigation devices are very costly and cannot be used in rural and sub-urban areas. The computer vision aids are bulky due to the usage of computers.

II. LITERATURE SURVEY

S.Chew (2012) proposed the smart white cane, called Blind spot that combines GPS technology, social networking

and ultra-sonic sensors to help visually impaired people to navigate public spaces. The GPS detects the location of the obstacle and alerts the blind to avoid them hitting the obstacle using ultra-sonic sensors. But GPS did not show the efficiency in tracing the of the obstacles since ultra-sonic tells the distance of the obstacle.

S.Gangwar (2013) designed a smart stick for blind which can give early warning of an obstacle using Infrared (IR) sensors. After identifying the obstacles, the stick alerts the visually impaired people using vibration signals. However the smart stick focused only for obstacle detection but it is not assisting for emergency purposes needed by the blind. And also the IR sensors are not really efficient enough because it can detect only the nearest obstacle in short distance.

Benjamin et al (2014) had developed a smart stick using laser sensors to detect the obstacles and down curbs. Obstacle detection was signalized by a high pitch "BEEP" using a microphone. The design of the laser cane is very simple and intuitive. The stick can only detect obstacle, but cannot provide cognitive and psychological support. There exists only beep sound that triggers any obstacle and there is no any assistance to direct them.

In 2015-16 Syed Tehzeeb Alam said that related to the guide cane there was also a smart cane invented with almost same configurations. This cane uses ultrasonic sensors and the servomotors to detect the obstacles. There is a microcontroller inside the cane which will work on the received instructions like right, left, straight etc. However this system also has some limitations like it not easy to handle and requires large area or space to be placed because they cannot be folded.

III. PROBLEM STATEMENT

Artificial Vision is the most important part of human physiology as 83% of information human being gets from the environment is via sight. The statistics by the World Health Organization (WHO) in 2014 estimates that there are 285 billion people in world with visual impairment, 39 billion of people which are blind and 246 with low vision. The oldest and traditional mobility aids for persons with visual impairments are the walking cane (also called white cane or stick) and guide dogs. The drawbacks of these aids are range of motion and very little Information conveyed. With the rapid advances of modern technology, both in hardware and software front have brought potential to provide intelligent navigation capabilities. Recently there has been a lot of Electronic Travel Aids (ETA) designed and devised to help the blind people to navigate safely and independently. Also

high-end technological solutions have been introduced recently to help blind persons navigate independently. The IR sensor and buzzer will not give accurate result to the blind people, this is the main drawback of previous project, in previous project IR sensor are the object detecting sensor, the problem associated with these reasons and less efficiency and loss the accuracy to detect object and one more problem is it will not provide clean information to blind people.

IV. CONCLUSION

The proposed system uses ultrasonic sensor based shoes to detect obstacles for ground level. This device is light in weight wearable device, which makes the system easy to carry. Also, the proposed system is low cost, which is a significant factor because 90% of the visually impaired in the world lead their life in low income. This system modifies the quality of visually impairer's life and decrease dependency on others for their social life. The moving speed of the new users of the device is less, after enough practice in short period of time. The blind persons achieve confidence and control over the device, the moving speed is enhanced.

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