Smart Navigational Shoes for Visually Impaired Person

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ABSTRACT: Eyes play an important role in our daily lives and may be the most precious gift people have eyesight. This universe is visible because they have eyesight. Eyesight Sight is considered the most important sense and the blind people are observed upon with pity by others. Blind people are part of this society, so technology needs to have a huge effect on their lives in order to make it as feasible and accessible to them today as unlikely for them. As a basic hardware system such as speaking OCR items, color recognition, barcode readers, the assistance given earlier for blind people was that hardware was costly and limited due to rapid capabilities. We try to present an application called Smart Shoes in this paper where it is a way to give hand to blind people with the help of technology to solve some of their problems faced. The outcomes of the application improve the awareness of the issues facing blind people on a daily basis, and can help promote further initiatives aimed at helping blind people live independently in their daily lives.

KEYWORDS: Android system, Blind, Shoes, Sensor, Visually impaired, Navigation, Assistance.

INTRODUCTION

It is estimated that 285 million people worldwide are visually impaired: 39 million are blind and 246 have poor vision, about 90 percent of the world's visually impaired live in low-income settings where 82 percent of people aged 50 and over are living with blindness. The primary cause of moderate to serious vision impairment is global uncorrected refractive errors; cataracts remain the leading cause of blindness in middle and low income countries.

Most people in India face the issue of visual impairment, which prevents them from being independent. It becomes a real challenge for them to locomotive when in an unknown setting. Where obstacles move away from the visually impaired person, in order for the blind to improve their sense of hearing or some guide to locate him in the new environment. Where they use movement cane, trained dogs or other assistive electronics equipment. The aim of the paper is to design a visually impaired person's smart assistive shoe so that they get rid of the cane and make them more independent. In this fast-paced life-now-a-day, this will also allow them to live freely [1].

The Smart Shoes are a novel system designed to help blind or visually impaired users negotiate obstacles and other hazards safely and easily. The user is supposed to be wearing the shoes during the process. The embedded device will notify the Android system that the user is using when the ping sensors from the Smart Shoes sense some obstacle [2]. The user must be able to communicate actively with the application on the Android device, purely through voice recognition. Together with the software on the Android device, the Smart Shoes can allow the user to walk around independently. In India, an estimated 15 million people are completely or partially visually impaired [3].

LITERATURE REVIEW

The collective use of various types of sensors, especially the active - passive combination, can be of great value to a complete and reliable obstacle detection sensing system. In order to identify an obstacle in different lighting or weather conditions, any precise form of technology might have hitches to satisfy all

the required needs. The muddled context and complex moving patterns of all objects in urban streets that might appear on a road scene require erudite processing of sensor inputs. A sensor - fusion and segmentation approach can be used to solve this issue [4]. Gemperle F, et al proposed that "Most of the assistive devices for the blind that exploit touch as the substitution sense are tactile displays for the fingertips and palms. Typical tactile displays involve arrays of vibrators or upward/downward moveable pins as skin indentation mechanisms.

The IR sensor and buzzer will not give the blind people reliable results, this is the main downside of the previous project, the object detecting sensor is the IR sensor in the previous project, the issue associated with these factors, and less reliability and loss of object detection accuracy, and another problem is that it will not provide blind people with clean details. To move in unfamiliar settings, many blind individuals need travel aids. We are presenting a Smart Shoes project that allows visually impaired users with impaired mobility to avoid barriers. This proposed device recognizes barriers such as curbs and stairs on the ground or even moving objects by exploiting current robotics technologies and transmits obstacle information through haptic feedback.

In general, being blind refers to a complete absence of functional vision. Blindness, however, requires differing levels of vision capability, often under varying circumstances. Vision is the result of light rays striking the back of the eye, or retina, and then transmitting electrical signals to the brain through the optic nerve. When an insufficient amount of light reaches the retina or details, blindness occurs [5]. This paper addressed the use of distance dimension ultrasonic and infrared sensors in the enlargement of a barrier detection device for seniors and people with vision impairment. Study findings show that, in terms of output voltage measurements, ultrasonic and infrared sensors have different characteristics. It is clearly stated that the ultrasonic sensor gives a representative of linear output while the infrared sensor displays a representative of nonlinear output. With a percentage of precision between 95 percent and 99 percent, both sensors are able to detect an obstacle at distances within their usable range [10].

There are various advantages of smart shoes for visually impaired person.

(1) The comparably higher accuracy and better comprehensibility, simplicity and low weight of an actuator System.
(2) It does not require users to hold or carry their smartphones in specific ways in order to be able to navigate properly.
(3) Navigation Assistance while travelling.
(4) Distraction-free travel.
(5) Automatic rerouting and alerts.
(6) Various User-controlled Vibration patterns.
(7) User friendly system.

DISCUSSION & CONCLUSION

This paper has proposed a navigational shoe device based on Android to allow use of the new technologies. Wearable electronic kits are recommended. The primary purpose of this suggested system is to provide this visually impaired individual with navigation assistance. Barriers will be detected by sensors, and vibrators will vibrate according to direction. When the right swing and left shoe are taken, the right cultivator will vibrate when right swing should be taken and left shoe will vibrate when left swing should be taken. Our approach is making easy applications to make visually impaired people live independently.

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