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Advance Device to Navigate Blind Person

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ABSTRACT: ***Eyes play an important role in our day to day lives and are perhaps the most valuable gift we have. It has been put into despair by a highly over-sighted area of applications for visually disabled individuals. Current solutions are proving to be ineffective or extremely costly. Above all, recent technical developments need to help the most disabled. The proposed strategies for autonomous mobility for visually disabled people have been surveyed here. This paper proposed a novel concept, Smart device with sensors embedded in them to fluidly direct a visually impaired person and to warn him/her of the obstacles in his path ahead of him. The aim of the design is to build an easy-to-use Android application to meet the special needs, used to direct the individual co extending the feature of a smart device.***

KEYWORDS: Android, Eye, Blind, Sensor, Obstacles, Assistance, Navigation, Software Applications.

INTRODUCTION

Eyes play an important role in everyone's daily lives and may be the most precious gift we have. This world is clear to us because, with eyesight, we are fortunate. Yet there are some people who have lost the ability to imagine these things. Because of this, they are going to have a lot of difficulties moving easily in public areas. Wearable devices should also be designed for such visually impaired individuals. A smart shoe is the concept of a wearable device to provide visually impaired people with directional details. In order to provide visually impaired people with intelligent and sensible navigation guidance, the system has great potential, especially when incorporated with visual processing units.

285 million people are estimated to be visually impaired worldwide: 39 million are blind and 246 have low vision, about 90% of the world's visually impaired live in low income settings, where 82% of people living with blindness are aged 50 and above. Globally, uncorrected refractive errors are the main cause of moderate and severe visual impairment; cataracts remain the leading cause of blindness in middle and low-income countries. The number of people visually impaired from infectious diseases has reduced in the last 20 years according to global estimates work and 80% of all visual impairment can be prevented or cured.

Most people in India face the issue of visual impairment, which prevents them from being independent. It becomes a real challenge for them to loco mote 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.

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. Our 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 (vibrations and beeps). Initial tests show that our device helps human users in indoor and outdoor environments to navigate safely. 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. Blindness happens when the eye is struck by an insufficient amount of light, or the data has not been properly transmitted to the brain.

Many people suffer from extreme visual impairment because they are stuck in their familiar world. People with complete blindness do not do even simple tasks, such as flipping on the fan, finding their everyday things, or going on a walk. The biggest concern with blind people is the lack of self-esteem and physical integrity, which causes them to lose self-confidence. They need to memories the location of each and every object of their need and challenge every time they step into a new environment[1]. They therefore require some instrument or technique that can assist them in their mobility and in performing daily tasks. One of the strategies is to use a trained dog that can support visually impaired people to navigate through the barrier by navigating. This technique, however, is not very successful as it takes a lot of work and time to train a dog and it is also quite hard for the blind person to take care of other living creatures. Another option is use of a cane which is again impractical because of its limited length[2].

There are various system and devices developed to navigate blind people.

Object Detection System for Blind People: Various diseases caused by Visual impairment and blindness have been hugely reduced, but there are many people who are at risk of age-related visual impairment. Visual information is the basis for most navigational tasks, so necessary information about the surrounding environment is not available to visually impaired people. In this context system proposes a system, named Smart Vision, the ability to move around in unfamiliar environments whose objective is to give blind users, whether indoor or outdoor, a user friendly interface. This paper proposes mainly in the development of the computer vision module of the Smart Vision system.

Ultrasonic Smart Stick for Visually Impaired People: Acquainted with the work done by making the walking sticks smart and more helpful. They reviewed and examined the literature related to this topic. It is necessary to modify these smart sticks as technology improves. The simulation results are determined using one microcontroller for the ultrasonic

sensors, the water sensor and the Bluetooth model. So in this paper-wide survey, work related to this project is done and we have shortlisted some useful elements from each project.

Energy Harvesting for Smart Shoes: Consumer reliance on wearable electronic devices has grown significantly in the past decade. As wearable electronic devices evolve and proliferate, there will be a growing need for more power delivery to distributed points around the human body. When more devices are transported, the conventional approach to power delivery is clearly becoming troublesome[3]. We are forced to either use more small batteries anywhere that need replacement or run wires to supply appliances from a central power source through our clothes. The production and storage of electrical energy in the devices themselves by scavenging waste energy from human activities is a new solution that removes the power wiring issue. A significant source of energy harvesting is the human activity of walking. A motion supporting device is proposed which can be used to help navigate in the surroundings and avoid collisions with obstacles[4]. This could help decrease health costs incurred and improve the quality of care and independence of the elderly. Conventionally, mobility-assisting devices have been electromechanical devices, in which the main function is to provide physical support for the elderly whilst moving around using canes and wheelchairs.

An ultrasonic sensor-driven navigation system for blind people, based on synthetic speech output microcontrollers and portable equipment to direct the user on urban outdoor paths to point out what choices to make. This system utilizes the high frequency ultrasonic beam echo theory to detect obstacles in the road. The vibro-tactile offers these mobility support instructions to decrease navigation complications. An ultrasound disadvantage is that walls can mirror or block ultrasound signals, resulting in less precise localization. To detect obstacles, a vibration and voice-operated navigation device was developed using ultrasonic sensors. Since people with visual impairments are more sensitive to hearing and have strong perceptions than ordinary individuals. Via vibration and voice feedback, this device gives alarm. The system operates both indoor and outdoor navigation and focuses on constantly detecting and alerting surrounding barriers through vibration and voice input. Depending on the distance between the obstacle and the user, the vibration motor is given various strength levels to warn the mobility of the user[5].

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 motion supporting system is proposed that can be used to help man oeuvre in the field and prevent obstacle collisions. This will help minimize the incurred health costs and boost the standard of elderly treatment and independence. Mobility-assisting systems have historically been electromechanical devices, where the primary purpose is to provide the elderly with physical assistance by using canes and wheelchairs to get about. In terms of obstacle detection and information processing,

microcontrollers and wireless network technologies and applications have improved the flexibility of these devices.

CONCLUSION & DISCUSSION

The suggested smart device for obstacle detection and navigation by visually impaired people, after observing the effects of different methods, defined different articles. With Arduino, which is a form of embedded device, smart devices are purchased. Instead of providing a complex, non-portable system, the embedded system addresses all the functions that a user needs to perform in that case. As the user walks with the sensors enabled, the processing of data will be performed dynamically. The processing of the values will be communicated from the sensors to the Arduino board and the through the interfacing hub to the smartphone. This, the complexity and the time will be low and the obstacle and be detected in a fraction of seconds. The proposed system will automate according to the real time path-ways and the obstacles coming in between.

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