IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Smart Shoes For Visually Impaired People Using

[1]Arjun joshi, [2]Akasha B V, [3]S Rachana, [4]Shrungar S G, [5]Somashekhar M R,

[1]Assistant Professor and [2,3,4,5]Students,
Department of Electrical and Electronics Engineering,
Vidya Vikas Institute of Engineering and Technology, Mysuru, Karnataka, India

Abstract: The major goal of this initiative is to help the blind walk normally by providing them with acoustic support and addressing their mobility issues. As a result, the initiative attempts to create a tool that could act as a navigational aid for them. The study focuses on creating a tool that will enable visually impaired (or blind) people to travel more easily and independently. One of the largest challenges that people with visual impairments encounter is travelling because, unlike sighted people, they are less aware of their location and direction in relation to traffic and other impediments as they walk both indoors and outdoors. The technique suggested in the research provides a remedy for those who are blind. The idea consists of smart shoes that warn visually impaired persons of impediments in their path and may enable them to walk without colliding as much. This paper's major goal is to present a dependable solution that includes a shoe that can connect with consumers via audio alert and pre-recorded messages. Unlike other creatures, they encounter hurdles along the road.

Index Terms **- ESP8266, APR33A3 module, Fire sensor, Ultrasonic, Panic, etc.**

I. INTRODUCTION

Persons with such problems are significantly impacted by blindness, low vision, visual impairment, and vision loss. They have effects on a person's physical, psychological, social, and economic well-being, which lowers their quality of life and prevents them from performing several Activities of Daily Living (ADL), the most important of which are mobility and navigation. Blindness is a qualitative phrase used to describe the clinical condition in which people lose their ability to perceive light completely. Blindness also describes those whose vision is so poor that they must mostly rely on their other senses to function. On the other hand, the phrase "visual impairments" is used to describe conditions where vision loss is accompanied by a loss of organ-level visual functions, such as the loss of visual acuity or the loss of visual field. In this research, a prototype model and a system design for a sophisticated electronic assistive device for the blind are presented. This system's goals include sending information about blind people and providing general measures for object detection. Microcontroller, ultrasonic sensor, and vibratory circuit make up the system. The goal of this project is to create an Electronic Traveling Aid (ETA) kit that will assist blind persons in navigating clear paths. The shoe is fixed to this ETA. When an object is found close to a shoe, a vibratory circuit alerts the user, and later, speakers or headphones are used to issue a spoken command via an Android application. The shoe is integrated with a self-power generation unit so that there is no power backup issue, which is the essential criterion in this case. A new device called "smart shoes" can help persons who are blind or visually challenged. A safer and more independent experience is offered by these shoes' sensors and haptic feedback, which can identify and warn the wearer of dangers in their way. The wearer can change their path and prevent collisions by wearing the smart shoes, which employ vibration or other sensory cues to indicate the presence of obstacles and their vicinity. Certain versions additionally come with voice navigation and GPS tracking, which adds more orientation and navigation support. An intriguing development in assistive technology is the creation of smart shoes for those who are blind or partially sighted. These shoes have the potential to dramatically increase mobility and independence, giving users more assurance and comfort when navigating their surroundings.

Fig 1. Blind people walking

1.1 PROBLEM STATEMENT

Moving is particularly challenging for blind people in public places because of the obstacles. It can be difficult to travel or even merely to stroll down a busy street. Blindness frequently makes it difficult for a person to perform a number of job duties, significantly decreasing their employment prospects.

1.2 OBJECTIVES

Modern technology is advancing quickly, and both the hardware and software fronts have the ability to offer capabilities for intelligent navigation. To assist blind persons in navigating securely and freely, many Electronic Travel Aids (ETA) have been developed recently. Moreover, cutting-edge technical options have lately been made available to assist blind people in independent navigation. With this initiative, an effort has been made to raise the system's quality so that blind people can benefit from it more. In this project, the system was created as a component of the shoe for a blind person. Also, we are using speakers, fire, water, and ultrasonic sensors in this project, all of which increase the accuracy of object identification and deliver clear information to blind persons.

FEATURES OF SMART SHOE

- Generate electricity while walking
- Health tracker
- Obstacle detection for blind
- Location finder using GPS
- Auto detection
- Having features to give indicate right path
- Less accident will be from the blind people
- Automatic rerouting and alerts

2. METHODOLOGY

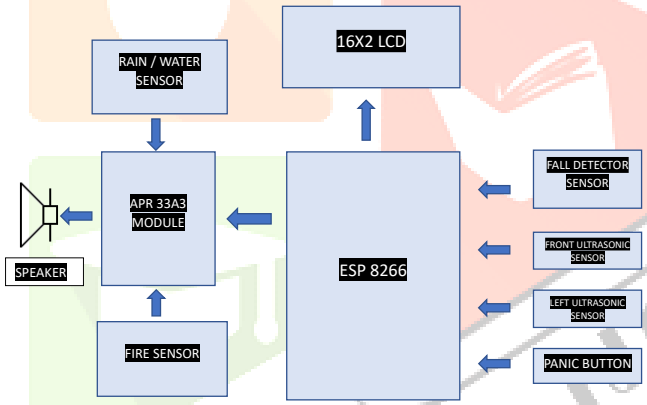

Fig 2: Block diagram

HARDWARE DISCRIPTION

1. Fire sensor

Fig 3. Fire sensor

A fire-sensor is a particular type of detector that is primarily made for both detecting and reacting to the existence of a fire or flame. Its fitment may affect the flame detection reaction.

2. Ultrasonic sensor

Fig 4. Ultrasonic sensor

For locating items that are some distance away from the robot, the ultrasonic sensor is helpful. Yet, the ultrasonic sensor doesn't require direct physical contact like the touch sensor does. There is greater room to reply due to the distance. The light sensor is typically utilized at shorter distances, while the ultrasonic sensor is typically used for distances of 10 centimeters or more. It is possible to modify applications that use the light sensor to work with the ultrasonic sensor.

3. Water sensor

Fig 5.Water sensor

The water sensor can identify the presence of water. Ten exposed copper traces make up the sensor, five of which are power traces and the remaining five are sense traces. These traces are organized in parallel, with a sensory trace positioned between every pair of power traces. These traces are not linked until they are submerged in water and are brought together by it. The traces act as variable resistance, changing in response to changes in water level. Every time the water sensor detects it, the analogue data from the sensor is converted into digital data by a microcontroller. With the aid of speakers, the warning is communicated to those who are blind. The speakers will begin to play an audio message that has already been setup.

4. APR33A3 module

Fig 6. APR33A3 module

The APR33A3 Speech Recorder and Playback Module includes a 0.5-watt test speaker and 8 channel recording and playback capabilities. 1/2W speaker is provided. TTL Interface Ports on Microcontrollers with Regard to Ground (not soldered on Board).

5. Display

Fig 7. Display

The 16x2 LCD modules are popular among do-it-yourselfers because they are affordable, simple to use, and most importantly, they allow us to provide information very effectively. We can fit a lot of info on the display using only 6 pins. A 16-pin module is used.

6. Fall detection

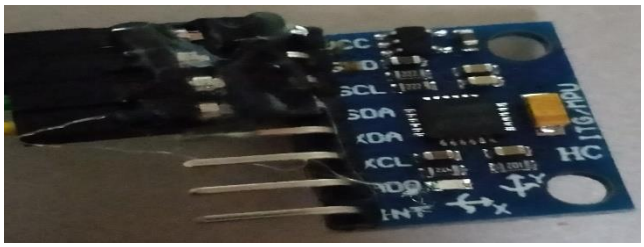

Fig 8. Fall detection

An efficient strategy for reducing fall-related injuries could be a medical warning system with automatic fall detection technology. When a user falls, these gadgets notify trained professionals, prompting an immediate emergency response.

7. Speaker

Fig 9. Speaker

Speakers are typically used to output audio or music. The transducers that transform electromagnetic waves into enjoyable sound waves are the speakers. So, the key to producing high-quality audio without harming your eardrums is a good speaker. We're providing the most affordable speakers in their class as a result. This speaker uses cutting-edge technology to deliver the greatest sound and bass. The polypropylene sheets emit sound waves that are pleasant and do not harm your eardrums. But it also offers you the ultimate musical experience. Hence, you have come to the right place if you are seeking for a speaker with a few great qualities.

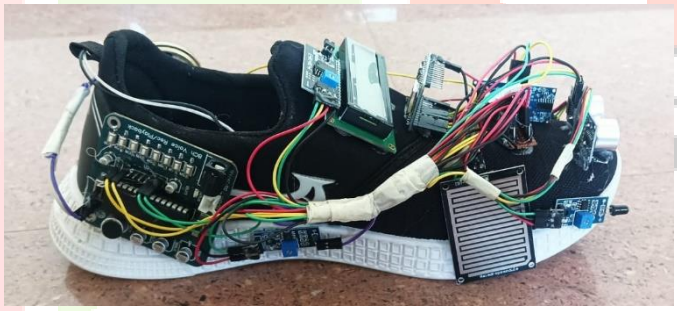

Fig 10: Smart shoe

ADVANTAGES

- Auto-detection.
- The ability to show the proper path, easy to use, and auto-detection.
- Fewer accidents involving blind persons will occur.
- This system can be used in both indoor and outdoor setting.
- An intuitive system.
- Help in navigation when moving.

3. CONCLUSION

The suggested work is an IoT-based solution that combines hardware and software to offer technical support. This technology is used by blind persons with vision impairments to detect obstacles, fires, and water bodies. It also detects a person's fall and notifies the person who should be notified. Ultimately, it was possible to develop inexpensive, independent, and electrically safe smart shoes for the blind and visually impaired that provide assistance in the case of falls and avoid unintentional collisions. Smart shoes for the blind have the potential to be a useful aid for mobility and navigation. By using sensors and haptic feedback, the shoes can detect and alert the wearer to obstacles in their path, providing a safer and more independent experience.

REFERENCES

[1] "Smart shoes for blind using internet of things: a review" by Pradeepa R (2021 IJCRT | Vol 9, Issue 2, February 2021 | ISSN: 2320-2882).

[2] "Smart shoes: assistive shoes for the visually impaired people" system proposed by Mr. Jitendra Singh, Ajay Yadav, Ajay Prajapat, Adhiraj Singh and Hemant Chohan (IJSRD/Vol. 5/Issue 02/2017/389).

[3] "Smart shoes: walking towards a better future" system proposed by Miss. Rutuja Anil Shinde, Dr. B. A. T. University. S. L. Nalbalwar and Dr. Sachin Singh (ISSN: 2278-0181IJERTV8IS070167 Vol. 8 Issue 07, July-2019).

[4] "Low-cost ultrasonic-based shoe for visually impaired people" system proposed by Shyamal mandal and Adarsha B. chandran (https://doi.org/10.1016/B978-0-12-817913-0.00012-2).

[5] BUZZFEET: Blind Man Shoes", Varsha Singh, Savita Sindhu, Romisha Arora Department of Computer Science and Engineering, Manav Rachna International Institute of Research and Studies, Faridabad, India. 2019 International Conference on Machine Learning, Big Data, Cloud and Parallel Computing (Com-IT-Con), India, 14th -16th Feb 2019.

[6] S.D. Asha Mahesh, K. Raj Supriya, M.V.S.S.N.K. Pushpa Latha, P. Gowri, T. Sonia, B. Nani, " Smart Assistive Shoes and Cane: Solemates for the Blind People", International Journal of Engineering Science and Computing, Volume 8 Issue No.4, April 2018.

[7] M. Madhu Meena, M.K. kadiravan, R. Kowsalya, R.J. Lokharaj, "Li-Fi Based Smart Shoe for Blind", International Journal of Engineering Science and Computing, Volume 9 Issue No.3, March 2019.

[8] Saylee Begampure, Renuka Deshmukh, Sheetal Chotaliya, Shubham Sirsat, "Smart Navigational Shoes for the Blind Person", International Journal of Innovative Research in Electrical, Electronics, Instrumentation and control Engineering, Volume 6, Issue 4, April 2018.

[9] Shlesha Khursade, Malavika Karunan, Ibtisam Sayyad, Saloni Mohanty, "Smart Shoes: "A Safe Future for the Blind", International Journal of Innovative Research in Computer and Communication Engineering", Volume No.6, Issue 5, May 2018.

[10] Vikram Singh Parmar, Krishna Sai Inkoolu, "Designing Smart Shoes for Obstacle Detection", Empowering Visually Challenged Users Through ICT", International Federation for Information Processing, 97-68-3-319-6768, August 2017.

BIOGRAPHIES

Mr. Arjun joshi received the BE degree in Electrical and Electronics Engineering in the year2019 from Vidya Vikas institute of Engineering and Technology, Mysuru and post-graduation degree in Power System Engineering from The National Institute of Engineering (NIE). Mysore in the year 2021 he is working as Assistant professor in department of Electrical and Electronics engineering at Vidya Vikas Institute of Engineering and Technology at Mysuru Karnataka. He has 02 years of teaching experience. He published one International Journals. His research interest includes Power System Operational Planning and Control Distribution System Network Reconfiguration, Service Restoration, Distribution System Automation and Distribution Generation, electric vehicle technologies, power quality.

The Electrical and Electronics Engineering programme at Vidya Vikas Institute of Engineering and Technology in Mysuru is being pursued by **Akasha B V (4VM20EE402).**

The Electrical and Electronics Engineering programme at Vidya Vikas Institute of Engineering and Technology in Mysuru is being pursued by **S Rachana (4VM19EE033).**

The Electrical and Electronics Engineering programme at Vidya Vikas Institute of Engineering and Technology in Mysuru is being pursued by **Shrungar S G (4VM19EE041).**

The Electrical and Electronics Engineering programme at Vidya Vikas Institute of Engineering and Technology in Mysuru is being pursued by **Somashekhar M R (4VM19EE046).**