SMART SYSTEM FOR BLIND PEOPLE

¹ Korapati Sateesh, ²S.Premkumar

Abstract--The articulate handle lets blind people understand and perform their work safely and quickly. With regular clamps the barrier cannot be perceived and standard clamping for people with visual impairments is not effective. Since the blind man doesn't realize which kind of things are going before him or what sort of things are going. The person cannot see what the scale is and how far he / she is from the target. It is challenging for the blind to drive about. If the sensors sense any obstructions, the consumer is alerted by the app through the Android device. The device is particularly helpful for visually disabled individuals who sometimes requires support from others. We checked and confirmed the reliability and performance of the device prototype.

Keywords-- Android, Impaired people, Navigation, Safety, Assistive technology

I   INTRODUCTION

Persons with vision disability have trouble communicating and sensing their surroundings. You may not have any interaction with the world [1]. Visual action is a concern to visually disabled individuals because it can be challenging, because they are not able to switch from one position to another, to discern between objects that come before them [2][3]. We focus on independence and financial assistance from their communities. A versatility is opposed to engaging with people and social events [4]. In the past, numerous technologies have been established with drawbacks without a clear knowledge of the non-visual experience. Scientists have been creating an adaptive and responsive clamp for decades to support, warn and educate people with visual impairments to barriers [5][6]. In the last decades modern technologies have been studied for a strong and effective method to identify hazards and to alert them of unsafe situations for visually disabled persons.

According to a 2011 WHO study, about 1% of the world's population has visually disability and 10% of the world's population is totally blind. Mobility is the biggest worry for the blind. You must be flexible depending on others [7]. This method provides a tool to help individuals with visual impairments manage. Today mobile Android is popular for everyone. Wearable computer must follow the route with the aid of the Android program [8]. Our device comprises of sensors and vibrators to monitor the atmosphere in which the blind individual provides guidance on the position of the closest barriers. The aim is to expand the senses of the individual without any noticeable effort during a training time. For blind men, we sell clever socks. In users' shoes the electronic part is fixed [9]. For fast movement, the customer should wear socks. Sensors sense barriers, vibrators vibrate along the

¹*Department of Electronics and communication Engineering, saveetha school of Engineering, SaveethaUniversity, Chennai-60215, TamilNadu, India,*

²*Department of Electronics and communication Engineering, saveetha school of Engineering, SaveethaUniversity, Chennai-60215, TamilNadu, India,*

direction left / right. Blind people don't have to focus on versatility with smart shoes [10]. This essay explains the design and addresses the possible advantages of our program.

II   LITERATURE SURVEY

The primary use of the Internet of Things is currently the wearable safety tracking system. Many adaptive systems are often equipped for people with visual disability. Here are not many structures mentioned. In the sensor-aided stick for blind persons, the system consists of a small blind stick and a sensor-based hazard detection circuit [11]. It is specifically built to enable the blind person travel safely from one position to another and to remove any obstacles. The software senses set and shifting items such that injuries may be avoided. The key feature of the device is the infrasound sensor used to search a default region around the blind by emitting waves [12].

There have been substantial declines in many disorders induced by vision defects and blindness, however people tend to be at risk of vision disability because of ageing. Visual awareness is the backbone of most navigational tasks, and prohibits young visually challenged individuals from getting valuable details regarding their fields. In that sense, the device, dubbed Smart Vision, offers the opportunity to navigate through a non-known setting with the goal of providing a user-friendly experience to blind users whether indoor or outdoor. This essay primarily discusses the machine vision application Smart Vision program.

A system use a white cane, without any help, to maximize blind and VIP agility. The device contains a sonar sensor to avoid obstacles, GPS to provide position info, RFID tags for indoor location and the calculation of locomotive tracks, thus resolving indoor GPS limitations, and a regional module for transmitting alert messages.

The reflected signals are obtained from the objects used as microcontroller inputs, and then used to determine the position and distance of the objects around the blind person. The main aim of this is to include an application for blind people to detect the obstacles in various directions, detect pits and manholes on the ground and make walking safer.

For visually disabled people a revolutionary stick is designed for quick navigation. By integrating with an ultrasonic sensor the blind stick will detect the water. Using ultrasonic waves the ultrasonic sensors are used in this device to detect obstacles. The sensor transfers the obtained data onto the microcontroller by sensing the obstacles. The microcontroller analyses the data and determines whether the person is close enough to the obstacle. When the barrier is not close to the microcontroller, so nothing is achieved by the circuit.
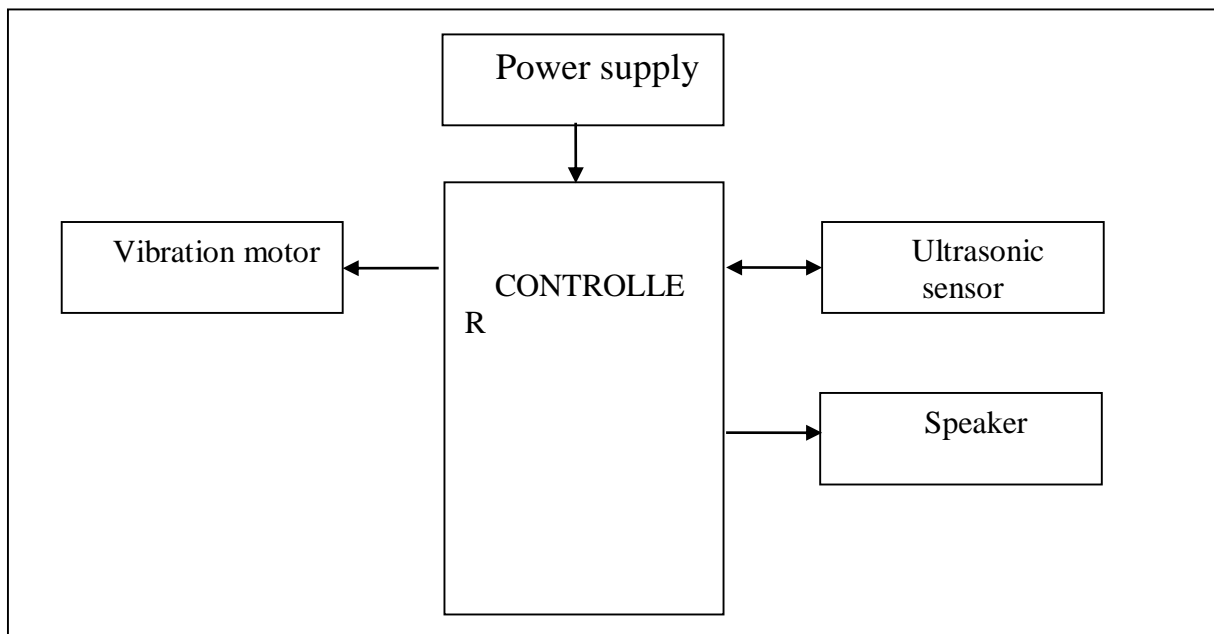
III PROPOSED APPROACH

Figure 1: Design of the proposed system

The aid consists of a microcontroller, an ultrasonic sensor and two vibration motor. The barrier detection area of the system consists of ultrasonic transmitters-receivers and two vibrations. It uses a 40 KHz ultrasonic signal to obtain information and can detect any obstacle in the specified calibration range of approximately 0.03 to 6 meters. It works by sending a pulse to the ultrasound. Eventually the pulse reflects from a solid object in the path of the pulse. The time between the outgoing pulse being transmitted and its echo is identical to that of the Turn right; Turn left Cross path Crossover junction; Pedestrian crossing; Steps; Suspension; Stop.

IV RESULTS

Those communities checked the new program. Most of them claimed their lifestyle was changed by giving them more trust in the program. Figure 2 shown the Ultrasonic sensor working.

Figure 2: Ultrasonic working

In several experimental experiments, the device has been used. A blind person was examined for the first field study of the road preparation. The research routes were approximately 100 meters wide.

V CONCLUSION

The articulate and precisely constructed walking stick lets blind people travel without support from one location to another. This may even be used as a blunt way to offer a sense of perception to the blind. This stick decreases the reliance of individuals with visual disability on certain family members, acquaintances and guide dogs. The planned mixture of numerous work units means that the users' role is controlled in real time and double input guarantees that access is more efficient and stable. The advantage of the program is that millions of blind citizens worldwide will use it as a low cost solution.

REFERENCES

1. Faria, José, Sérgio Lopes, Hugo Fernandes, Paulo Martins, and João Barroso. "Electronic white cane for blind people navigation assistance." In 2010 World Automation Congress, pp. 1-7. IEEE, 2010..

2. Dunai, Larisa, Guillermo Peris Fajarnes, Victor Santiago Praderas, Beatriz Defez Garcia, and Ismael Lengua Lengua. "Real-time assistance prototype—a new navigation aid for blind people." In IECON 2010-36th Annual Conference on IEEE Industrial Electronics Society, pp. 1173-1178. IEEE, 2010.

3. Fernandes, Hugo, Paulo Costa, Vitor Filipe, Leontios Hadjileontiadis, and João Barroso. "Stereo vision in blind navigation assistance." In 2010 World Automation Congress, pp. 1-6. IEEE, 2010.

4. Zeb, Aurang, Sehat Ullah, and Ihsan Rabbi. "Indoor vision-based auditory assistance for blind people in semi controlled environments." In 2014 4th International Conference on Image Processing Theory, Tools and Applications (IPTA), pp. 1-6. IEEE, 2014.

5. Farcy, R., and Y. Bellik. "Locomotion assistance for the blind.[in:] Universal Access and Assistive Technology." (2002): 277-284.

6. Petrie, Helen, Valerie Johnson, Thomas Strothotte, Andreas Raab, Steffi Fritz, and Rainer Michel. "MoBIC: Designing a travel aid for blind and elderly people." The Journal of Navigation 49, no. 1 (1996): 45-52.

7. Guerreiro, João, Eshed Ohn-Bar, Dragan Ahmetovic, Kris Kitani, and Chieko Asakawa. "How context and user behavior affect indoor navigation assistance for blind people." In Proceedings of the Internet of Accessible Things, pp. 1-4. 2018.

8. Simões, Walter CSS, and V. F. De Lucena. "Blind user wearable audio assistance for indoor navigation based on visual markers and ultrasonic obstacle detection." In 2016 IEEE International Conference on Consumer Electronics (ICCE), pp. 60-63. IEEE, 2016.

9. Gallay, Mathieu, Michel Denis, and Malika Auvray. "Navigation assistance for blind pedestrians: guidelines for the design of devices and implications for spatial cognition." Representing space in cognition: Interrelations of behaviour, language, and formal models (2013): 244-267.

10. Sánchez, Jaime, and Eduardo Maureira. "Subway mobility assistance tools for blind users." In Universal Access in Ambient Intelligence Environments, pp. 386-404. Springer, Berlin, Heidelberg, 2007.

11. Honig, Michael, Upamanyu Madhow, and Sergio Verdu. "Blind adaptive multiuser detection." IEEE Transactions on Information Theory 41, no. 4 (1995): 944-960.

12. Cardoso, J-F. "Blind signal separation: statistical principles." Proceedings of the IEEE 86, no. 10 (1998): 2009-2025.

13. Maharaja, D., & Shaby, M. (2017). "Empirical Wavelet Transform and GLCM Features Based Glaucoma Classification from Fundus Image." International Journal of MC Square Scientific Research, 9(1), 78-85.

14. Saravanan, N. (2013). "Hand Geometry Recognition based on optimized K-means Clustering and Segmentation Algorithm." International Journal of MC Square Scientific Research, 5(1), 11-14.