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Smart Stick for Blind People

[1]N.Loganathan, [2]K.Lakshmi, [3]N.Chandrasekaran, [4]S.R.Cibisakaravarthi, [5]R.Hari Priyanga, [6]K.HarshaVarthini
[1,2,3,4,5,6]Department of EEE, Sri Krishna College of Engineering and Technology,
Coimbatore, Tamilnadu, India
[1]logukirsh@gmail.com, [2]klakshmi01@gmail.com, [3]chandru11sethu@gmail.com, [4]srcibi511@gmail.com,
[5]psakshi652@gmail.com, [6]harshavarthini30@gmail.com

Abstract— Blind person finds it difficult to detect the presence of any obstacles in their way while moving from one place to another and it is very difficult to find the exact location of the stick if it have been misplaced. Thus, the smart stick comes as a proposed solution to help the visually impaired people in their day to day living without the help of others. In this paper we proposed a solution for the blind people by using an ultrasonic sensor in the blind stick. The instrument stands used to perceive the obstacles at the range of four meters and infrared instrument is castoff to perceive the nearer complications in front of the blind people. Thus the radio frequency transmitter and receiver help the user to find the exact location of the smart stick with the help of buzzer. The vibration motor which is placed in the smart stick gets activated and produces a vibration when any obstacle is detected. This proposed method uses the Arduino UNO as controller. The branch is accomplished of sensing all difficulties in front of the user. The smart stick is of user friendly, quick response, very low power consumption, lighter weight and it is easy to hold and fold by the user.

Keywords—obstacles, ultrasonic sensor, radio frequency transmitter and receiver, controller, vibration.

I. INTRODUCTION

The WHO (World Health Organization) estimates that by way of of 2015 around 940 million publics through around grade of vision forfeiture. 246 million publics had short apparition and 39 million publics are blind. The common of public with unfortunate vision is in the unindustrialized creation besides stand concluded the oldness of 50 ages. The serious problem encountered by blind people is mobility. They are not connected with the surrounding environment. They don't know about the things happening around them and require some time to realize what has happened. Most of the blind people are unemployed because of their visual impairment. They don't have any suitable job to lead their life without depending on others. When walking in the roads they eventually face many problems such as obstacles, collision with others, manholes. Blind people rely on their families and others for mobility and financial needs. Their visual impairment affects their interaction with others and social activities. Many solutions were proposed in the past but still has limitations in them. These limitations may be caused due to lack of the proposals to analyze and provide solutions in the view of visual impaired perception.

Researchers have made many researches and proposals to provide a solution for visually impaired people to overcome obstacles and alert the blind person in case of any danger.
The implementation of our proposal has done after referring some previous innovations of visually impaired people assisting devices. As referred in Wearable Difficulty Finding Structure intended for visually reduced public the blind person is alerted of the obstacles on his way. This system figure outs the nearby obstacles by using stereoscopic sonar system and determines the location of the obstacles through vibrio tactile feedback.

A 3D Ultrasonic stick is discussed in the paper "Osama Bader AL-Barrm International Journal of Latest Trends in Engineering and Technology (IJLTET)" [2] for blind people. In this the stick contains of instruments towards inspect 3 dissimilar guidelines, a microcontroller, beeper and direct current pulsation motorized. The beeper then pulsation motorized stands triggered once slightly barrier stands sensed. In adding, the baton is outfitted through global positioning system and short message service system. global positioning system provides the in sequence concerning the place of the blind people consuming the pole toward his personal memberships. Short message service system is secondhand by the blind to guide short message service toward the kept records in the microcontroller fashionable circumstance of urgent situation. Computer recreation stands complete toward heart the concert of the structure consuming Porteous software then Relaxed pic equipment. Though, this structure consume interruption though sensing the complications amid 3 to 5 second. The holdup aimed at the global positioning system towards become the position used for the pole is approximately 25 second to 1 minute. Trendy accumulation towards that, global positioning system cannot remain

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consumed internal since of the global positioning system indicator determination be too weedy.

This proposed system [3] apparatus a new technique for backing of blind people by means of the ultrasonic sensors and a global positioning system modem. The system will make available the obstacles evading feature and vehicle dash prevention to the blind people. The voice playback and pulsation motors will provide instant alert for blind people in case of any obstacle detected in their alleyway. In addition, we have a global positioning system modem related to the microcontroller. It gives the emergency let go by sending a memorandum to the matching care takers of that person all the way through global positioning system modem.

The major parts used in this proposed system Wearable steering assistance - a tool for the blind [4], stand: a multi-sensing structure (comprise audio hallucination, audio assortment sentence then lobby group instruments), a map, a counsel structure as well as concrete human-machine boundary. But menace is with the uneven performance of the instruments owing toward the proposal of the individual and maximum schemes usage hearing yield. This restricts through normal noises, then accordingly decreases the intelligence of inquiry: it disrupts a significant steering suspicion of the screen. A different problematic remains the extended exercise retro that stands required.

Another learning on the paper "Ankit Agarwal, Deepak Kumar, Abhishek Bhardwaj- worldwide Journal of Engineering and Computer Science ISSN:2319-7242 Volume 4 Issue 4 (April 2015), Page No. 11375-11378 [5]", analyze the prevailing electronic supports aimed at blind public as well as do not debate slightly completing outcomes. Created happening the boundaries trendy obtainable assistances, this proposed system an superior secondary electronic assistance consuming recent equipment comparable Ultrasonic waves, Camera, global positioning system, global system for mobile communication for the real impair public, In adding toward that, wherever global positioning system organization cannot stand cast-off they made use of the camera with some algorithm for to identify the difficulties. Similarly, this proposed system objectives towards progress disaster activate aware scheme lengthwise through propose.

II. PROPOSED SYSTEM

The smart stick which stands thought via the blind public detects the presence of obstacles by using ultrasonic and infrared sensors. Ultrasonic sensor has transmitter and receiver modules. The transmitter module transmits ultrasonic waves for detecting obstacles within 4 m. The receiver module receives the ultrasonic waves hit by the obstacles. The receiver sends signals to the vibrator motor and it vibrates.

Infrared sensor helps in presence or absence of water as well as change in heat in the surrounding. Infrared sensors find obstacles by using the temperature of them. Infrared sensor sends signals to buzzer. The buzzer gives audio signals and alarms the blind person.

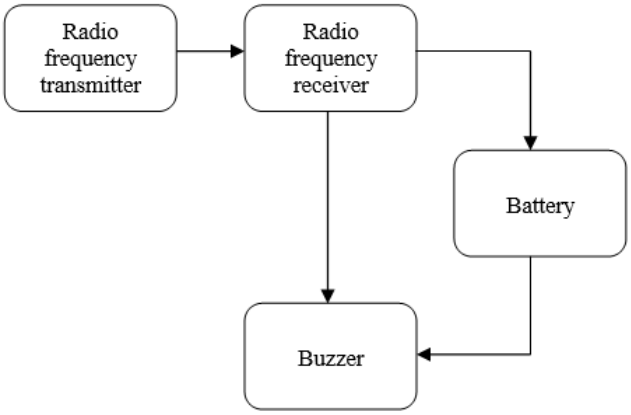

Fig.1.Block diagram of IR wireless control system

The blind people wore a wrist band which is used to support the blind public towards invention where the stick is present. The wrist band consists of push button, encoder and transmitter. When the push button in the wrist band is pressed, the encoder encodes signals and the transmitter transmits the signals. The handle of the stick has decoder, receiver and buzzer. The receiver receives the signals and decodes them. The decoded signals are sent to the buzzer. The buzzer gives alarming sound and helps the person to find where the stick is present.

A. *Block Diagram*

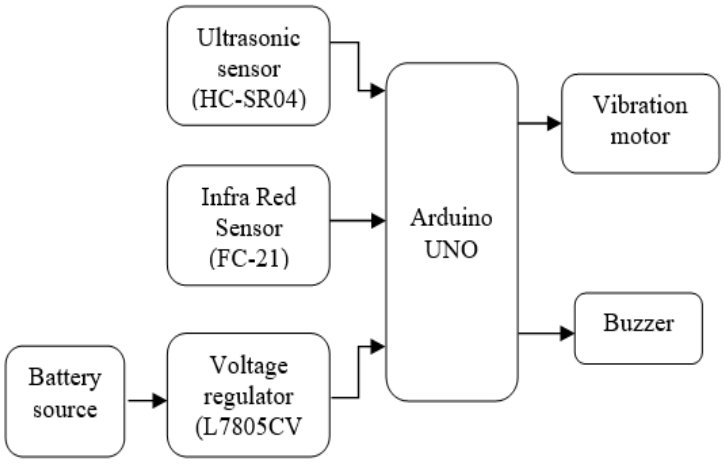

Fig.2.Block diagram of Smart Stick

B. Hardware Diagram

Fig.3 Prototype model of the stick

III.CONCLUSION

This proposed idea is an attempt towards progress the life of visually reduced public by providing mobility as well as safety measures without the dependency of others. The blind people can stay connected with surrounding environment with the help of this smart stick. They can move safely wherever they wish to go without getting injured from the surrounding obstacles and hurdles. This idea can be improved further by adding additional sensors thereby increasing the utility factors of the stick and the applications.

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