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# Blind Stick using Ultrasonic Sensor with Voice Announcement

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***Abstract:*** *God gifted sense of vision to the human being is an important aspect of our life. But there are some unfortunate people who lack the ability of visualizing things. The visually impaired have to face many challenges in their daily life. The problem gets worse when there is an obstacle in front of them. Blind stick is an innovative stick designed for visually disabled people for improved navigation. The paper presents a theoretical system concept to provide a smart ultrasonic aid for blind people. The system is intended to provide overall measures – Artificial vision and object detection. The aim of the overall system is to provide a low cost and efficient navigation aid for a visually impaired person who gets a sense of artificial vision by providing information about the environmental scenario of static and dynamic objects around them. Ultrasonic sensors are used to calculate distance of the obstacles around the blind person to guide the user towards the available path. Output is in the form of sequence of beep sound which the blind person can hear.*

***Keywords:*** ESP826612E, ATmega328, Thingsspeak IOT, Energy Meter, Display.

## I. INTRODUCTION

The visually impaired are at a considerable disadvantage because they often lack the information for avoiding obstacles and hazards in their path. They have very little information on self- velocity, objects, direction which is essential for travel. The system designed will detect an object or obstacle using ultrasonic sensors and gives audio instructions for guidance. An obstacle as close to minimum distance can be detected by this module. A resolution of obstacle distance has been designed and achieved. It is very important to maintain efficient information while traveling to the blind people. This system has been aimed at design and development of a smart and intelligent blind stick which helps in navigation for the visually impaired people. The navigator system designed will detect an object or obstacle using ultrasonic sensors and gives audio instructions for guidance. The algorithm developed gives a suitable audio instruction depending on the duration of ultrasound travel. We developed this system to detect the obstacle while travelling and give voice notification to visually impaired people. In this paper, a solution is proposed to move safely and detect obstacle in their path. Solution was composed of a foldable stick with a pair of IR sensor mounted on it. Connected to an earphone to alert the blind with speech warning message about the detected obstacle.

The most common tool that the blind currently use to navigate is the standard white cane. We decided to modify and enhance the walking cane, since blind are only able to detect objects by touch or by cane.[1] In the past different systems are designed with limitations without a solid understanding ofthe non-visual perception. Some of the systems are only for indoor navigations, and has no hurdle detection and determining location feature in outdoor environment. Researchers have spent the decades to develop an intelligent and smart stick to assist and alert visually impaired persons from obstacles and give information about their location The user sweeps the cane back and forth in front of them. When the cane hits an object or falls off of the edge of a stair, the user then becomes aware of the obstacle – sometimes too late. We accomplished this goal by adding ultrasonic sensors at specific positions to the cane that provided information about the environment to the user through audio feedback. Total blindness is the complete lack of form and visual light perception and is clinically recorded as NLP, an abbreviation as “no light perception”. Blindness is frequently used to describe severe visual impairment with residual vision. Those described as having only light perception have no more sight than the ability to tell light from dark and the general direction of a light source. The

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system has been developed using both the hardware and software implementations. The main component of this system is the Radio-Frequency module which is used to find the stick if it is misplaced around.

## II. LITERATURE SURVEY

The main aim of this system is to permit blind persons to explore autonomously in the outside environment. Ordinary route navigational systems in the outdoor environment are expensive and its manufacturing is time consuming. Blind people are at extensive drawback as they regularly do not have the data which is required, while passing obstacles and dangers. They generally have little information about data such as land marks, heading and self velocity information that is crucial for them to explore them through new environment. The aim of the overall system is to provide a low cost and efficient navigation aid for blind which gives a sense of artificial vision by providing information about the environmental scenario of objects around them. Today technology is improving daily in different aspects in order to provide flexible and safe movement for the people. In this technology driven world, where people strive to live independently, this paper propose a low cost 3D ultrasonic stick for blind people to gain personal independence, so that they can move from one place to another easily and safety. A portable stick is design and developed that detects the obstacles in the path of the blind using ultrasonic sensors. It consists of these sensors to scan three different directions, a microcontroller, buzzer and DC vibration motor. This study aims to develop a tool that can be used to detect obstacles for blind people. This tool also uses the HC-SR04 ultrasonic sensor. The method used in the manufacture of blind assistive prototypes in the form of sticks using Arduino and Ultrasonic Sensors for blind people with the method obtained by hardware design techniques used consists of ATMEGA328 as the main controller, Ultrasonic sensor HS-SRF04 as detecting objects and LM2596 Regulator modules used for lowering the DC voltage level, this study has produced a prototype design stick for blind people using sensor technology to help alert and move.

The objective of this study is to improve the quality of life for the visually impaired by restoring their ability to self-navigate. In this paper we describe a compact, wearable device that converts visual information into a tactile signal. This device, constructed entirely from commercially available parts, enables the user to perceive distant objects via a different sensory modality. Preliminary data suggest that this device is useful for object avoidance in simple environments

## III. PROPOSED SYSTEM

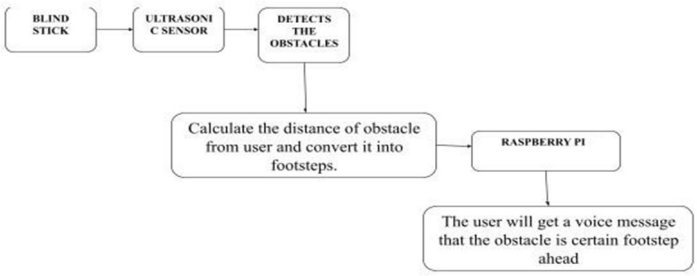
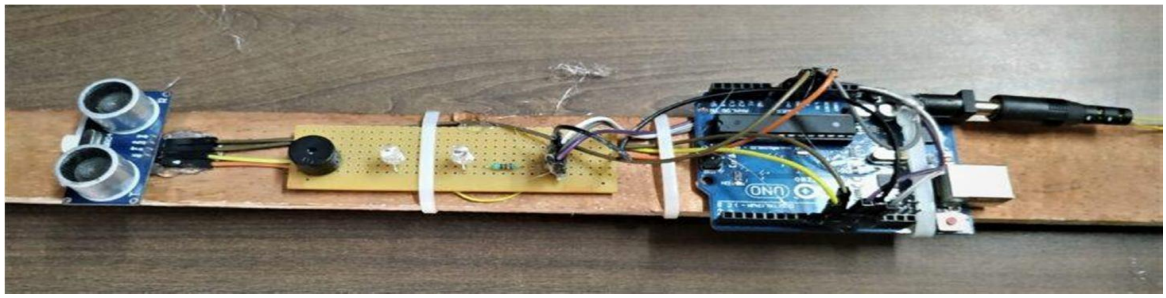



Fig.1. Block Diagram



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## IV. CONCLUSION

All the studies which had been reviewed show that, there are a number of techniques for making a ultrasonic blind stick for blind people. The aim of this paper is to get familiar with the work done in making walking stick smarter and more helpful. The literatures related to this topic were reviewed and analysed. As technology improves these smart sticks need to be modified. The simulation results are expected for the ultrasonic sensors, water sensor in one microcontroller. So in this paper wide survey of the work related to this project is done and we have shortlisted some useful aspects from each project. This will also help to decide designing approach. The Smart Stick acts as a basic platform for the coming generation of more aiding devices to help the visually impaired to be more safe. It is effective and afford. It leads to good results in detecting the obstacles.

## ACKNOWLEDGMENT

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