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Blind Stick Using Ultrasonic Sensor with Voice announcement and GPS tracking

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Abstract : for blind individuals. Basically, the ultrasonic detector is enforced within the walking stick for detection the obstacles ahead of the blind/impaired persons. If there are any obstacles, it'll alert the blind man to avoid that obstacles and therefore the alert in Our project proposes a low-priced walking stick supported latest technology and a brand-new implementation are created for economical interface the shape of voice announcement and buzzer to form a lot of helpful the stick is additionally mounted with the water detector that detects and alerts the blind if any wetness content is present to avoid slippery methods. Daily in several aspects so as to produce versatile and safe movement for the individuals. During this technology driven world, wherever individuals try to measure severally, this project propose a low-priced stick for blind individuals to achieve personal independence, in order that they will move from one place to a different simply and safely. A conveyable stick is style and developed that detects the obstacles within the path of the blind using sensors. The buzzer and vibration motor are activated once any obstacle is detected. Additionally, the stick is provided with GPS and SMS message system. GPS system give the knowledge relating to the situation of the blind man using the stick with his relations. SMS system is employed by the blind to send SMS message to the saved numbers within the microcontroller just in case of emergency.

Keywords– GPS, GSM, microcontroller, Ultrasonic Sensor, water sensor

I. INTRODUCTION

Blindness could also be caused because of temporary or permanent injure to any portion of the eye, the optic tract, or the realm of the brain accountable for vision will cause visual impairment. Visually impaired individuals facing several issues in their daily life, usually have a tough time to navigate outside the surroundings. The crucial physical incapacity is that the visual disorder. The blind individual ought as to step ahead. Worldwide, between three hundred million and four hundred million individuals are because of numerous causes. In keeping with world health organization (WHO), regarding thirty-six million are blind, earlier blind individuals were wholly relied on coached dogs and white canes to move severally in unknown areas. Product developed for the visually impaired have specially focused on communication tools like reading machines and stamping printers for such how that resulting in their approval by the blind community the amount of the individuals blind from infectious diseases has prevented within the last twenty years in keeping with world estimates work. During a constant technically developing worlds several electronic devices are came into exist that reduces the issues facing by those who are with incapacity. A straightforward system has been planned and developed that facilitate the blinds to move outside independently.

II.   LITERATURE SURVEY

[1] Shruti Dambhare et.al

In this paper presents a theoretical model and a system conception to produce a sensible electronic aid for blind individuals. The system is meant to produce overall measures – Artificial vision and object detection, real-time help via GPS. The aim of the system is to produce a low cost and efficient navigation for blind, which provide a way of artificial vision by providing data concerning of the environmental state of affairs static and dynamic objects around them. The advantage of the system lies within the in disputable fact that it will persuade be terribly inexpensive answer to many visually handicapped person worldwide. The projected combination of varied operating units makes a period of time system that monitors position of the user and provides twin feedback creating navigation a lot of safe and secure.

[2] Pankaj Patil et.al

In This paper focuses on coming up with a tool for visually impaired people who facilitate them in move severally comfortable to use. The device is coupled with a GPS to spot the placement of the blind man. moreover, it provides voice tuned in to avoid obstacles supported inaudible sensors. Associate emergency button is additionally provided to the system. The complete device is intended to be little and is employed in conjunction with the stick.

[3] Dr. Sarika Raga et.al

This project presents a style and implementation of sensible walking stick that helps the blind individuals to travel on an individual basis. The projected hardware system consists of Arduino Nano, IR sensor, voice playback module, GPS receiver module and therefore the GSM. The detection of obstacles is completed using associated IR device. The IR device detect the presence of associate obstacle ahead of it and passes the information to Arduino nano. Method the information received and calculates whether the obstacle is shut enough or not.

The processed information is fed to the voice playback module that provides voice help to the visually handicapped person through a speaker to avoid the collision between the obstacles. To create a lot of helpful the stick is additionally mounted with the wetness device that detect and alerts the blind if any wetness content is there to avoid slippery methods. The GPS receiver has been used for safety purpose to trace location of the user. If the blind folks would like associate facilitate then they can trigger an emergency button that is mounted on the stick then the GSM will send the situation info to the predefined contact numbers inside two minutes. This whole setup are going to be mounted on the stick. All effort is being created to create this stick is to be cheaper in addition as simple to use. With of these options the blind folks will improve their navigation ability and to not rely upon anyone whereas walking in unknown places.

III.   METHODOLOGY
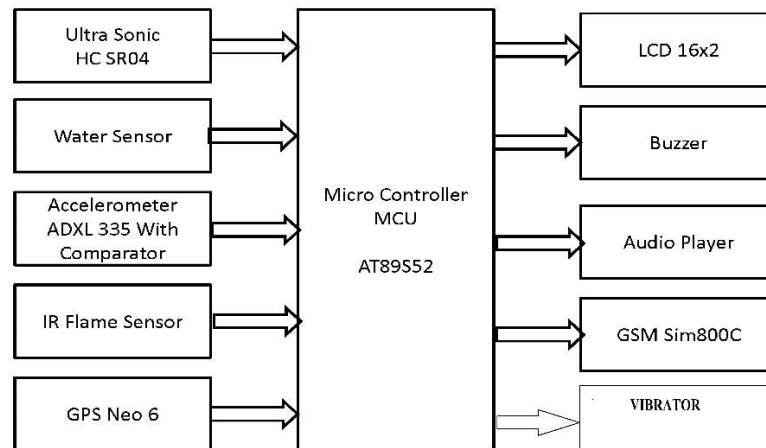
3.1 WORKING OF THE SYSTEM

Figure 1: block diagram

The 5-volt DC supply is given to microcontroller AT89S52 and all the sensor for supply voltage. The input components of microcontroller is ultrasonic sensor, water sensor, accelerometer, IR flame sensor, GPS neo6 and output components of microcontroller is LCD 16 x2 display, Buzzer, Audio Player and GSM 800C, Vibrator. The microcontroller are provided the instructions through programme. Then the input sensors sense and the logic is provided to microcontroller, then microcontroller will send the output from according to desired programme to output components, which is LCD display, audio player, buzzer, vibrator gsm sim.

3.2 Mathematical formula for designing

(1) The range = high level time * velocity (340M/S) / 2

3.3 At89s52 Microcontroller

The AT89S52 contain low power, high- performance 8-bit microcontroller with 8000 bytes of in-system programme non-volatile storage. The on-chip flash permitted the program memory to be reprogrammed in-system and by a programmable flash on the monolithic side chip, the Atmel at89s52 may be a powerful microcontroller that provide a highly flexible and efficiently answer to severally embedder's management applications. The at89s52prfovides the subsequent customary features:8k bytes of flash, 256 bytes of ram, thirty-two i/o lines, watchdog timer, 2 knowledge pointers, three 16-bit timer/counters, a six-vector two-level interrupt design, a full duplex interface, on-chip generator, and clock electronic equipment. Additionally, the at89s52 is intended with static logic for operation all the way down to zero frequency and supports 2 package selectable power saving modes. The idle mode stops the main frame whereas permitting the ram, timer/counters, interface, and interrupt system to continue functioning. The power down mode saves the ram contents however freezes the generator, disabling all alternative chip functions till consequent interrupt or hardware reset.

3.4 Ultrasonic Sensor

Ultrasonic devices are primarily used to measure the distances between the obstacle/object and the sensor. The ultrasonic device works on Doppler effect.it consist of a supersonic transmitter and a receiver. The transmitter transmits the signal in one direction. This transmitted signal is then mirrored back by the obstacle and received by the receiver. So, the whole time taken by the signal to induce transmitted and to received back are used to calculate the gap between the supersonic device and also the obstacle.

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3.5 Accelerometer (ADXL335)

The accelerometer is a tiny, thin, low power, 3-axis accelerometer signal condition voltage outputs. The merchandise measures acceleration with a minimum complete vary of the ± 3 *g*. It is measurement the static acceleration of gravity in tilt-sensing applications, moreover as dynamic acceleration ensuring from motion, shock, or vibration.

3.6 IR Flame Sensor

A flame observer could be a detector designed to detect and answer the presence of a flame or fireplace, permitting flame detection. Responses to a detected flame rely on the installation, however will include sounding an alarm, flame observer will typically respond quicker and additional accurately than a smoke or heat detector because of the mechanism it uses to detect the flame.

3.7 GSM Modem

In our model we tend to use GSM for sending and receiving information using text message, since GSM is associated with open, digital cellular technology used for sending mobile voice and knowledge, we 've got placed. This module within the stick, once the visually handicapped person pulse has a below a threshold price then victimisation this module text messages are communicated to his friend.

3.8 Gps Neo6

The NEO-6 module series may be a family of complete GPS receivers that includes the high performance u-box vi positioning engine. These versatile and efficient receivers provide various property choices during memory choices create NEO-6 modules ideal for battery operated mobile devices with terribly strict value and house constraints.

3.9 Vibrator

Figure 2: vibrator

This is a vibrator brick appropriate as a non-audible indicator. Once the input is high, the motor can vibrate a bit like your telephone on silent mode.

3.10 Buzzer

Apply 3V to 5V to the current buzzer module and you will be rewarded with a loud 2 KHz BEEP. Not like an apparent piezo, this buzzer doesn't would like associate degree AC signal. within may be a piezo part and the motive force electronic equipment that produces it oscillate at 2KHz. The buzzer is 5V TTL logic compatible and bread board friendly pin spacing.

3.11 Audio Player

Audio Player Is Nothing But A Speaker, Which Is Connected At The Output Of The System For Announcement Purpose. As Per the System Application, According to The Visual Based Guide, The Respective Saved Audio File is Played Using A Speaker.

IV.   CONCLUSION

The main goal of our project is to provide smart walking stick to the blind, so they can navigate with ease without taking help from other peoples. By using microcontroller and other small sensors, the hardware implementation is very cost effective. Size of model is very compact so the stick is very comfortable to carry along. By the application of voice playback module in any language instructions can give so these stick we will use worldwide. The main function of our model is sending emergency message to the take careers of blind person within 2 minutes and also location which is effectively done by the application of GSM and GPS module.

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