Advanced Voice Based Blind Stick with Voice Announcement of Obstacle Distance

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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 they travel to an unfamiliar location. The old system are not work properly in outdoor applications. In this paper, we propose a navigation device for the visually impaired which is focused on providing voice output for obstacle prevention and navigation using the ultrasonic sensor, ADXL325 sensor. We also use the GSM/GPS module, voice ic, mike and buzzer. Using this system we alert the blind person's relatives.

Keywords: GSM/GPS, Microcontroller, Ultrasonic Sensor, Voice IC, ADXl325 Sensor, Mike, Buzzer

I. INTRODUCTION

There are approximately 85% of information human get being from environment. And there are 330 million people are visual impaired in the world. The smart phones allow those people to listen to voice mails. Another example is the laser or ultrasonic technology. Thus, the distance to the obstacle is calculated according to the time variance between the two signals.

This GPS technology used to identify the position and location for the blind person. Ultrasonic sensors are much more efficient than other obstacle detection sensors.

There are other several systems related to the aid mobility of visually impaired are existing. Also the author uses GPS location information to provide directions to blind people within a campus environment. A smart cane was aimed to guide the blind people by using of onboard sensors for obstacle avoidance. The system is based on an ultrasonic sensor in which it detect obstacles and command.

II. OBJECTIVE

The main objective of this system is it gives the secure path to the blind person. It also navigate the blind person both indoor and outdoor applications.

III. WORKING OF THE MODULE

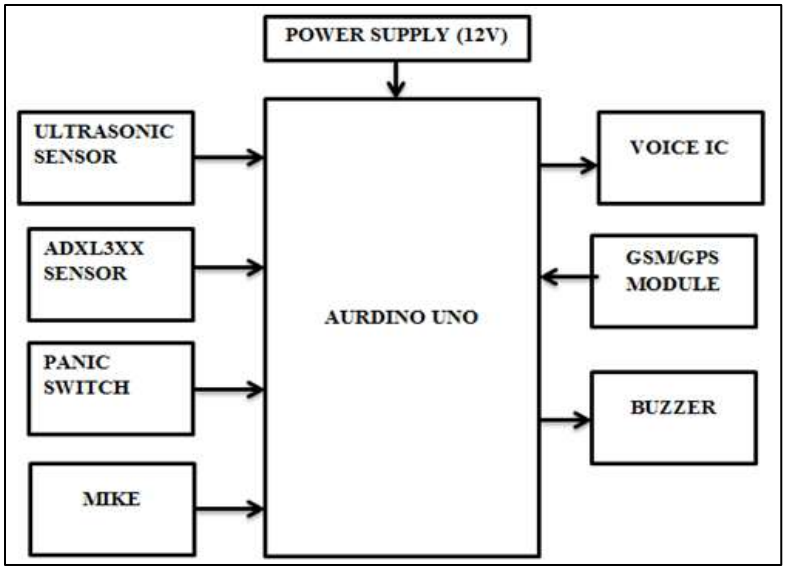

Fig. 1: Block Diagram of Voice Based Blind Stick

In this system we use the two sensor one for the obstacle finding and another for the movement of stick in right or left direction. For obstacle finding we use the ultrasonic sensor. Also use the ADXL325 sensor for the tilt of the stick. This sensor are connected to the microcontrollers. The sensor sends the signal to the buzzer, voice ic, panic switch. Advantage of this system is the if the blind person get in the accidental condition then the system alert the relatives of blind person.

A. Ultrasonic Sensor

The ultrasonic sensor is used for the obstacle detection and also for depth sensing. Ultrasonic sensor are also called as the transceiver means the it can transmit and receive the signal. Ultrasonic transmitter emitted an ultrasonic wave in one direction, and started timing when it launched. At last, the ultrasonic receiver would stop timing when it received the reflected wave. As Ultrasonic spread velocity is 340m / s in the air, based on the timer record t, we can calculate the distance (s) between the obstacle and transmitter, namely: The principle of ultrasonic distance measurement used the already-known air spreading velocity, measuring the time from launch to reflection when it encountered obstacle, and then calculate the distance between the transmitter and the obstacle according to the time and the velocity. Thus, the principle of ultrasonic distance measurement is the same with radar or sonar. Distance Measurement formula is expressed as: L = C X T In the formula, L is the measured distance, and C is the ultrasonic spreading velocity in air.

B. Microcontroller

In this system, we used the AVR ATmega microcontroller. This is 28 pin ic it also contain the 14 digital pins and 6 analog pins. It contain the flash memory, RAM, ROM for storage purpose. In the microcontroller programmable input/output, core processor are presents. The microcontroller are made for the embedded applications. Microcontrollers are used in automatic devices and various appliances, in automobiles, in industrial machinery, power appliances. By decreasing size and cost compared to the device it contain separate processor, memory and input/output devices.

C. ADXL345 Sensor

It is an accelerometer used for the measuring speed in digital form. This sensor is used in this system if the stick are drop from the blind persons hand then the sensor sends the signal to the controller. With the help of this sensor we easily know about the blind person are in accidental condition or not. For that we use the panic switch.

D. Panic Switch

In this system we are also used the panic switch. Suppose the blind person are goes under the any accident or the stick are drop from his hand then this panic switch automatically press then the message is send to the blind persons relatives via GSM.

E. Buzzer

The buzzer is an electronic, electromechanical device. Which are used for the alarm system. It is an emergency triggering alarm system.

IV. SOFTWARE DESIGN

A. Algorithm

1) Start
2) If check obstacle stop else move forward buzzer ON.
3) If check depth stop else change path buzzer ON.
4) If set path GPS sending continuous location to the controller and person.
5) Listen path using headphone.
6) If path are not set move forward randomly.
7) If path is missing send message authorized.
8) Stop.

V. CONCLUSION

We develop the system for blind persons. With the help of this system the blind person is easily to move both indoor and outdoor. It aim to solve the problem occurs in blind persons path. It also check the safety of the blind persons. This paper analyze the existing electronic system for blind person. On the basis of existing electronic system we overcome the limitations. In this system we use the GSM/GPS model. We also design the emergency triggering alarm system.

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