Smart Blind Stick

Vinay Kumar G N[1],Vishnu Vardhan ReddyB[2],Varsha ReddyP[3,] Anand J[4]

[1,2,3]UG Student, Department of Electronics and Communication Engineering Madanapalle Institute of Technology & Science Madanapalle, Andhra Pradesh, India

[4]AssistantProfessor, Department of Electronics and Communication Engineering Madanapalle Institute of Technology & Science Madanapalle, Andhra Pradesh, India

ABSTRACT -

This paper describes a blind stick with the use of Arduino. Recently WHO has revealed a report that globally 43 million people are living with blindness. Every day we see that many blind and visually impaired people find it difficult to detect obstacles while walking on the road. To help them, a smart stick system concept has been invented to provide smart electronic assistance for blind people. The system provides artificial vision and helps in locating objects, assists in real time through the GPS module using Arduino. The system detects any object around it and sends feedback in the form of speech, alert, message through earphones and also facilitates a real time health monitoring system of a blind person. The overall goal is to provide low cost and efficient navigation and obstacle detection aids for blind people

Keywords:Arduino,Ultrasonicsensor,Walkingstick

1.   INTRODUCTION

This blind stick is one of the traditional sticks using ultrasonic sensor, Arduino, pulse sensor, GSIM, GPS module, hc05- bluetooth module. Arduino is a small controller that can do all the math with great speed and great accuracy with great speed. Ultrasonic sensors are used to detect objects and to calculate the distance between a blind person and an object. Pulse sensor is used to measure the heart rate of a blind person. GPS, GSIM is used to track the real-time location of a blind person, to send an automatic SMS to the caregiver in the event of a blindfold or a coma.
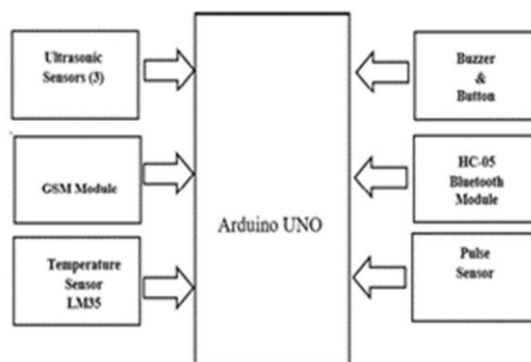
2.   BLOCKDIAGRAM

Fig1:BlockDiagram

3. HARDWAREREQUIREMENTS

3.1 ARDUINOUNOR3

Arduino UNO board based microcontroller Atmega328P. It has 20 of the 16 digital input and output pins and 6 analog pins, 16mhz quartz crystal, power jug, ICSP header and reset button. Compared to the PIC microcontroller, it is much easier to do with arduino as it is easy to use, the operating voltage is 5V, you can connect it directly to the computer via USB cable, power it with an AC-DC adapter or battery.

3.2 ULTRASONICSENSOR

Ultrasonic sensor is used to detect an object in front of a person. The ultrasonic HC-SRC04 sensor has 4 pins - Ground, Vcc, Trigger and Echo. It grows from 2 to 400 cm. It basically has two spaces - one is the transmitter used to transmit the signal and the other is the receiver used to receive the signal. It sends ultrasound waves at high frequency and receives the signal back

3.3 PULSESENSOR

The Pulse Sensor is a well-designed plug-and-play Arduino heart rate sensor. It can be used by students, artists, athletes, game developers and developers and young people who want to easily incorporate live heart rate data into their projects..

3.4 VOLTAGEREGULATOR

A voltage regulator is a stabilizer designed to automatically stabilize a constant level. The circuit is made up of a 7805 voltage controller with capacitors and resistors, and a diode bridge made of diodes. The power sources in the circuit may fluctuate which results in uninterrupted power output. The IC controller keeps the output voltage constant. It is used to stabilize the voltage level as per circuit. The LM7805 IC provides +5Volts controlled electricity and offers additional heat sinks..

3.5 TEMPERATURESENSOR(LM35)

The LM35 is an accurate integrated circuit temperature sensor whose output voltage varies depending on ambient temperature. This is a small and inexpensive IC that can be used to measure temperatures anywhere between -55 ° C to 150 ° C. It can be easily connected to any microcontroller with ADC function or any development platform such as Arduino

3.6 HC05BLUETOOTHMODULE

The HC-05 Bluetooth Module is an easy-to-use Bluetooth SPP (Serial Port Protocol) module, designed for transparent serial setting. The HC-05 Bluetooth module provides switch mode between slave mode which means it can use nonreception or data transfer.

4 METHODOLOGY

Working behind this blind cane is that it is used for a special purpose as a hearing aid for blind people. The circuit provides 5V of the circuit and maintains its output voltage at the same level. It is widely used to detect objects using an ultrasonic sensor and an IR sensor. If an object is present, the ultrasonic sensor detects the object by measuring the distance between the object and the user and sends the data to arduino UNO. To determine the distance of an object, calculate the distance between sending the signal and receiving the signal. *Distance = Speed*Time The speed of the air signal is 341m / s. The time is calculated between sending and receiving a signal. Since the distance traveled by the signal is doubled, it is divided into pairs i.e., Distance=*Distance/2.

The condition of the order is as follows
 [1] If the distance between the object and the blind person is less than 30 inches on the left side of the blind person then it will send a voice command as to the left
[2] If the distance between the object and the blind person is less than 30 inches on the right side of the blind person then it will send the voice command correctly.
[3] If the distance between the object and the blind person is less than 30 inches in front of the blind person then it will send a voice command as a Center
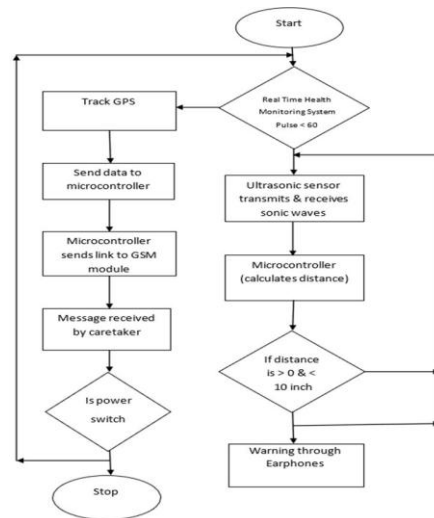.

4.1FLOWCHART

Fig2:Flowchart

5FUTURESCOPE

The proposed model could be expanded in terms of providing voice alerts that violate the barrier information in front of the blind person. Using the latest android apps that include text-to-speech conversions can be used to make the system have a visual connector connected to both the ultrasonic sensor and the android app to further sign a blind person about obstacles in his path.

6CONCLUSIONS

The Blind Walking Stick has finally been developed into a prototype that can be used to guide the blind. It aims to solve the problems faced by blind people in their daily lives. The system also takes measures to ensure their safety. This project will work to help all the blind people in the world make it easier to travel wherever they want. It is designed to help the blind to move forward in the best possible way. It is used to help people with blindness to facilitate mobility and increase safety.

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