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# Third Eye for Blind

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**Abstract:** People with visual impairments often depend on outside help that can be provided by the following agencies Humans, well-trained dogs, or special electronic devices are used as decision support systems. Principal The problem for blind people is how to navigate where they want to go. Those people need Help from other people with good eyesight. As described by the World Health Organization, 10% of people with visual impairment have There is no functional vision to help them move safely without assistance. This article is Designed to help blind people overcome visual defects through the use of other senses, such as sound and Touch. The system uses the Atmega328 microcontroller, which is a high performance 8-bit AVR RISC microcontroller. To detect the distance, the system uses HCSR04, an ultrasonic range Finder distance sensor module. The sensor module is designed to use sensors to measure distance The SONAR or RADAR principle uses ultrasound to determine the distance of an object. This The system also includes a buzzer that generates an alarm sound and a motor that generates vibration. Sign. The system uses audio and vibration signals to notify users of upcoming obstacles. What The distance between the glove and the obstacle, the frequency of the audio signals and vibration is reduced Increase. Therefore, the system helps to simplify the navigation process for those who need it. The system provides a Low-cost, reliable, portable, energy-efficient and powerful navigation solutions Response time is short.

**Keywords:** Arduino Nano, Ultrasonic Sensor, Gsm module, DHT11

## I. INTRODUCTION

The third eye for the blind is a portable device that can help people with a visual disability to move in an indoor environment. This reduces the work of people who support the blind. In addition, it also provides opportunities for those of people with visual disabilities to go from where independent locations are located. Technology has developed a lot of recent and people are interested in them. This device is especially useful when people want to move at home or move to their own interior location. In this device, the distance of the obstacle is determined using an ultrasonic module and a microcontroller. Also the project is having a feature of sending message to their assisting people when they stuck in any situation. The obstacle distance is measured to be informed of the person with visual disabilities in the form of buzzer or vibration. The DHT11 sensor added for temperature detection. People can move in other directions and use it to avoid collisions. This project uses only microcontrollers instead of using the entire Aldyno plate, reducing the size of the device significantly and minimizes the cost. The final result of work is a glove with a portable band attached to gloves that all components are connected on the PCB, which works with high precision and reliability.

## II. COMPONENTS USED

### A. Arduino Nano

Arduino Nano is a small, complete, breadboard-compatible board based on the ATmega328P released in 2008. It provides the same connectivity and specifications as the Arduino Uno board in a smaller form factor. Arduino Nano is equipped with 30 I/O male headers. The configuration is similar to DIP30. You can use the Arduino software integrated development environment (IDE) for programming. The IDE is common to all Arduino boards and can be run online or offline. The board can be powered by a type B microUSB cable or a 9V battery. The Arduino Nano has a number of facilities for communicating with a computer, another Arduino, or other microcontrollers. The ATmega328 provide UART TTL (5V) serial communication, which is available on digital pins 0 (RX) and 1 (TX). An FTDI FT232RL on the board channels this serial communication over USB and the FTDI drivers (included with the Arduino software) provide a virtual com port to software on the computer. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino board. The RX and TX LEDs on the board will flash when data is being transmitted via the FTDI chip and USB connection to the computer (but not for serial communication on pins 0 and 1). A SoftwareSerial library allows for serial communication on any of the Nano's digital pins. The ATmega328 also support I2C (TWI) and SPI communication. The Arduino software includes a Wire library to simplify use of the I2C bus.

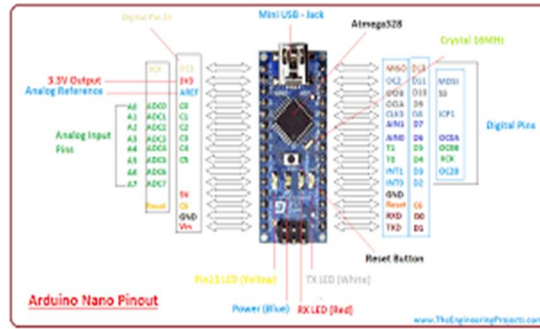


Fig1.Arduino Nano Pinout

**B. Ultrasonic Sensor**

Ultrasonic sensors provide a very low cost and simple distance measurement method. This sensor is ideal for any application that requires measurements between moving or stationary objects. Of course, robotic applications are very popular, but you will also find this product useful in security systems, or as an alternative to infrared if necessary. You will definitely appreciate the economy of the active status LED and the use of a single I V O pin. Ultrasonic sensors use sonar to measure distance; the unit emits ultrasonic pulses (much louder than the human ear) and the target distance is determined by measuring the time required for the echo. The output of the ultrasonic sensor is a pulse of variable width corresponding to the distance to the target.

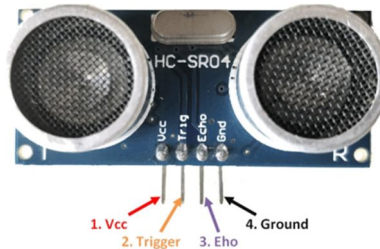


Fig 2.Ultrasonic Sensor

**C. Vibrating motor**

An eccentric rotating mass vibration motor or ERM, also known as a pager motor is a DC motor with a displaced (asymmetric) mass attached to its shaft. When the ERM rotates, the centripetal force of the polarized mass is asymmetric, resulting in a net centrifugal force, causing the motor to move. Due to the high number of revolutions per minute, the engine is constantly moved and moved by these asymmetric forces. It is this repeated displacement that is perceived as vibration. The vibration generated by ERM is an example of "conduction of harmonic vibrations". This means that there is an external driving force that causes the system to vibrate, sometimes called forced vibration. The term "harmonic" means that the system is forced to vibrate at the excitation frequency. It is important to remember that in the case of the ERM model, the drive input is not the DC voltage applied to the motor. Instead, it is the rotation of the mass around the axis of the central motor.



Fig 3.Vibrating motor

**D. Buzzer**

The buzzer is made up of many switches or sensors connected to the control unit. The control unit determines if which button is pressed or if a preset time has elapsed, and generally turns on the corresponding button or light on the control panel as follows: A continuous or an intermittent buzz or beep is emitted.

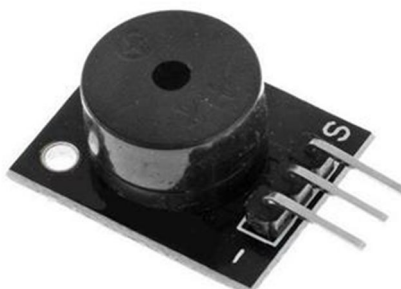


Fig 4. Buzzer

**E. GSM Module**

A GSM modem or GSM module is a hardware device that uses GSM mobile phone technology to provide a data link to a remote network. From the perspective of mobile phone networks, they are essentially the same as ordinary mobile phones, including the need for a SIM card to identify themselves on the network. A GSM modem usually provides a TTL-level serial interface for its host. They are usually used as part of an integrated system.

The GSM GPRS module is used to carry out communication between the microcontroller (or microprocessor) and the GSM \ GPRS network. Here, GSM stands for Global System for Mobile Communications and GPRS stands for General Packet Radio Service.



Fig 5. GSM module

**F. DHT 11 Sensor**

DHT11 is a commonly used temperature and humidity sensor with a dedicated NTC to measure temperature and an 8-bit microcontroller to generate temperature and humidity values \u200b\u200bas serial data.

DHT11 Sensor module		
1	Vcc	Power supply 3.5V to 5.5V
2	Data	Outputs both Temperature and Humidity through serial Data
3	Ground	Connected to the ground of the circuit

Table 1.



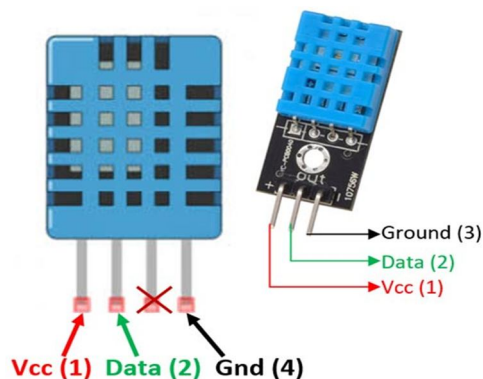


Fig 6. DHT 11 module

### III. IMPLEMENTATION

The blind ultrasonic vibrating gloves are developed using Arduino Nano, Ultrasonic sensor(HC SR04),Vibrating motor,buzzer,GSM module,DHT 11 and voltage regulator, with detachable the outlet while moving the module toward an obstacle. The ultrasonic sensor module detects obstacles. Therefore, when a person moves forward, he will point to an obstacle and send ultrasonic waves in the direction he is pointing. If a person get stuck at any point, we add up a Gsm module for sending message to their assisting people with the help of switch. The DHT 11 sensor added for the temperature and humidity information. The ultrasonic module calculates the distance between the obstacle and the person. When the obstacle is not detected, that is, when it is not within the distance range used in the program code, when the person does not feel any output, the module is inside reach, so that the obstacle is detected and the LED lights up., The vibration motor vibrates and the buzzer sounds. We can see that the LED lights up when an obstacle is detected, where the delay of the LED lighting up or the continuous buzzer sounding depends on the distance between the ultrasonic sensor and the obstacle. If the distance is larger, the delay is higher and if3 The distance is smaller, the delay is smaller, that is, when we approach an obstacle, the buzzer sounds and the LED lights up faster.



Fig 9. Model of project

### IV. EXISTING SYSTEMS

- A. White cane
- B. Pet dog
- C. Smart device (eg flashlight for the blind).

The existing system has problems: the white cane is easy to break √ break, and the cane gets stuck in the cracks of the road surface of different objects. Domestic dogs paid a huge price. (~ \$ 42,000 √ 280000Rs) Common Disadvantages (including smart devices) It is uncomfortable to carry and requires a lot of training to use. The characteristic of the third eye of the blind: The use of this device can completely avoid the use of other devices such as white canes. The device will help blind people navigate without having to hold a stick, which is a very accurate and annoying feature for them. They can just wear it as a belt or cloth, and they may just need a little training to use it.

### V. BLOCK DIAGRAM

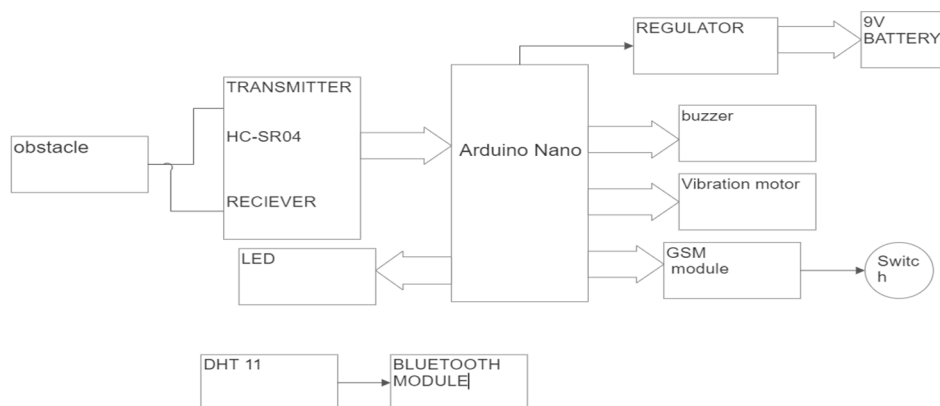


Fig 10. Block Diagram of Module

### VI. CONCLUSION

Blind people need constant help to do their daily housework. The third eye of the blind is a device that helps the blind to work independently in an indoor environment. It was developed to help blind people overcome lack of vision through the use of other senses (such as sound and touch). The combination of the Atmega 328P microcontroller and the HCSR04 ultrasonic sensor is used as input to calculate the distance between the obstacle and the blind person, and another combination of the vibration motor and the buzzer is used to instruct the person about the obstacle. Also GSM module is design in this device for more help to blind people. Therefore, ultrasonic sensors are used to detect very effective and accurate obstacles. The detachable ATmega328p microcontroller from Arduino nano is used to process the duration obtained from the ultrasonic sensor, and finally receives the output in the form of sound and touch through three LED devices, buzzer and vibration motor. Therefore, a simple, cheap, efficient, easy-to-transport, configurable and easy-to-operate electronic guidance system has been developed to provide constructive assistance to the blind. With this system, if built with maximum precision, blind people will be able to move without the help of others.

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