

Management System for Body Distance

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ABSTRACT: Today's the developing world shows various adventures in every field. In each field the small requirements are very essential to develop big calculations. By using different sources, we can modify it as our requirements and implement in various field. In earlier days the measurements are generally occur through measuring devices. But now a day's digitalization as is on height. Therefore, we use a proper display unit for measurement of distance. We can use sources such as sound waves which are known as ultrasonic waves using ultrasonic sensors and convert this sound wave for the measurement of various units such as distance, speed. This technique of distance measurement using ultrasonic in air includes continuous pulse echo method, a burst of pulse is sent for transmission medium and is reflected by an object kept at specific distance. The time taken for the sound wave to propagate from transmitter to receiver is proportional to the distance of the object. In this distance measurement system, we had ultrasonic sensor HC-SR04 interfaced with arduino Uno R3. Programming and hardware part of ultrasonic sensor interfacing with arduino Uno R3.

Keywords: Arduino, Uno R3, Body distance, Ultrasonic



1. INTRODUCTION

Bats are wonderful creatures. Blind from the eyes but the vision is sharper than humans, Ultrasonic ranging is the technique used by bats. Ultrasonic sensor provides an easy way in distance measurement. The sensor is perfect for distance measurements between moving or stationary objects. Ultrasonic Sensor measure the distance of the objects in air through non-contact technique. They measure distance without damage and are easy to use and reliable.

These distance measurement sensors connect with all common types of automation and telemetry equipment. Machinery and processes in a wide range of industries use distance measurement sensors where size or position feedback is required. Distance measurement sensors are used to control or indicate the position of objects and materials. Distance measurement sensors can determine the dimensions of objects such as height, width and diameter, using one or more sensors.

The echo time response of ultrasonic sensor detector is based on time of travel after trigger pulse to the surrounding objects is non-linear and depends on the reflectance characteristics of the object surface.

Ultra-Sonic sensors are widely used for distance measurement purposes. They offer low cost and a precision of less than 1 cm in distance measurements of up to 6m [1, 2]. However, the most popular method used in these measurements is based on the time of flight (ToF) measurement. This ToF is the time elapsed between the emission and subsequent arrival after reflection of an Ultrasonic pulse train travelling at the speed of sound. This causes large response times for a single measurement.

2. OBJECTIVE

Design and implementation of management system for body distance device by Arduino Uno, at a low cost, which ensures that we monitor the distance via the LCD.

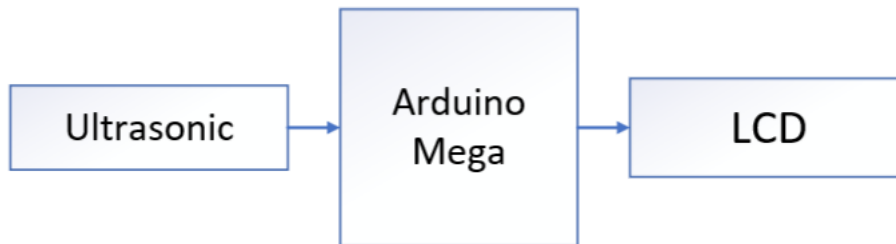


FIGURE 1. Block diagram of Ultrasonic Distance Detection with Arduino

In this work, distance of the object is measured through ultrasonic distance sensor and the sensor output is connected to signal conditioning unit and after that it is processed through Arduino microcontroller. The measured results are displayed in liquid crystal display.

3. METHODOLOGY

First thing we need to do is it insert the Liquid Crystal Library. We can do that like this: Sketch > Include Library < Wire.h > & < LiquidCrystal_I2C.h . Then we have to create an LCD object. In the setup we have to initialize the interface to the LCD and specify the dimensions of the display using the begin() function.

In the loop we write our main program. Using the print function we print on the LCD. The setCursor function is used for setting the location at which subsequent text written to the LCD will be displayed. The blink function is used for displaying a blinking cursor and the noBlink function for turning off. The cursor function is used for displaying underscore cursor and the noCursor function for turning off. Using the clear function we can clear the LCD screen . [3]

After completing the connections of a circuit, we will program the Arduino with the Code

- First , must download the ARDUINO IDE program from the official website (<https://www.arduino.cc/en/main/software>).
- After download , we must to install it like any program .
- After the installing is done , the main screen of the program.
- Write the following code on the Arduino IDE program .

```
delay(150);  
digitalWrite(trigPin, LOW);  
delayMicroseconds(2);  
digitalWrite(trigPin, HIGH);  
delayMicroseconds(10);  
digitalWrite(trigPin, LOW);  
duration = pulseIn(echoPin, HIGH);  
distance = duration / 58.2;  
String disp = String(distance);  
lcd.print("distance :");  
lcd.setCursor(0, 1);  
lcd.print(disp);  
lcd.print(" cm");  
delay(150);  
lcd.clear();
```

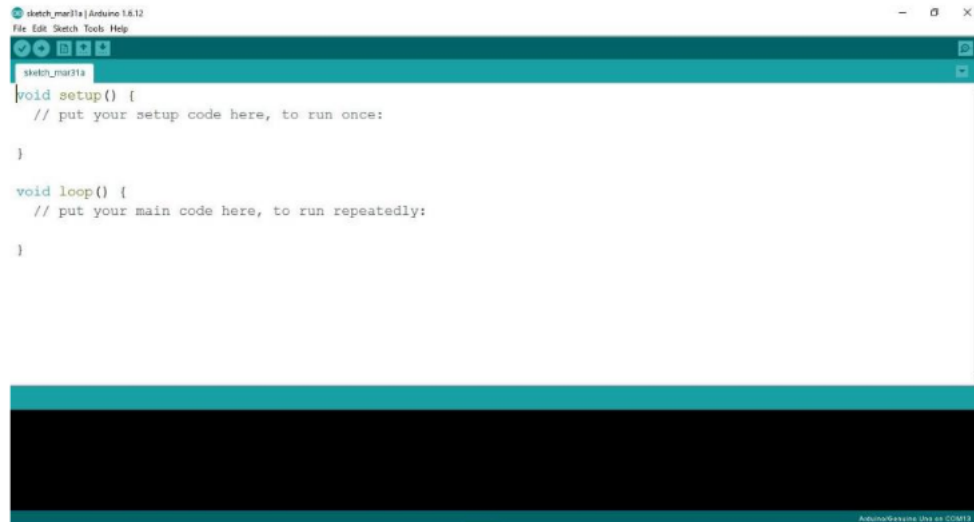


FIGURE 2. Arduino IDE

4. RESULTS AND DISCUSSION

Distance measurement using ultrasonic sensor and arduino consist of a transmitter part of ultrasonic module unit's ultrasonic high frequency waves in the form of polices after collision of these wares with any object, these wares detected by microphone time taken by these wares from transmitter and receiver is used to measure distance from any object. We had used a ultrasonic sensor module of HC-SR04, because this ultrasonic module is initiated with pulse of 10us The distance from any object is calculated from.

$$\text{Distance} = \text{Speed} * \text{Time}$$

Where:

$$\text{Speed} = \text{Sound speed in Air} = (340 \text{ m/s}) / 2$$

The human audible range can be converted measure the distance precisely manner.

5. CONCLUSION

The system that was presented in this research paper is an initial system for the correct use of the concept of measuring the distance of objects using Arduino techniques and computer programming. Especially at the present time when the world suffers from the spread of epidemics and diseases.

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CONFLICTS OF INTEREST

The author declares no conflict of interest.

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