Human proximity Alert System for Social distance COVID19.

B.Tech. Lab Project Report

On

(19EC3018) Biomedical Electronics & IOT for HealthCare

By

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Declaration

The **Biomedical Electronics & IOT for HealthCare** Project Report entitled "**Human Proximity Alert System for Social Distance COVID19**" is a record of bonafide work of T.Aditya Abhinav Bearing registration ID 190040529 submitted in partial fulfilment for the award of Bachelor of Technology in **Electronics And Communication Engineering.**

We also declare that this report is of our own effort and it has not been submitted to any other university for the award of any degree.

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Certificate

I hereby certify that the work which is being presented in the B.Tech. Project Report entitled **"Human Proximity Alert System for Social Distance COVID19"**, in partial fulfillment of the requirements for the award of the **Bachelor of Technology in Electronics & Communication Engineering** and submitted to the Department of Electronics & Communication Engineering of KLEF, Vaddeswaram, Guntur is an authentic record of my own work carried out during a period from August 2020 to November 2020 under the supervision of Ali Baig Mohammad**, ECE Department**.

Signature of Candidates

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I express the sincere gratitude to our HOD Dr. **Suman Maloji** for his administration towards our academic growth.

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ABSTRACT

The term social-distancing (S-D) is a way to stop or slow the spreading of contagious disease. In other words, it means less physical communication between two or more persons. In S-D the gap between two living beings (normally human) is 6 feet (two meters). In this short note, we propose a proximity-based alarming device that alerts the user when he or she crosses the threshold S-D limit.

This equipment will help people to maintain safe distance among themselves that ultimately help avoidance of spreading coronavirus. This model is the integration of the proximity sensor and an alarming mechanism.This prototype has been tested on a toy for validation purposes.

In the simulation this device an ultrasonic sensor will be used to sense the signal when a person coming towards the sensor.This sensed signal will give an output as in the form of Buzzer sound and a Glowing LED.

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OBJECTIVE OF THE PROJECT:

To maintain social distance from others in the pandemic Situation of Covid-19 to maintain our lives as healthy as Possible.

SOFTWARE TOOL:

- Arduino IDE
- TINKER CAD

DESCRIPTION:

The **Arduino Integrated Development Environment (IDE)** is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++.It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards.

The source code for the IDE is released under the GNU General Public License, version 2. The Arduino IDEsupports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub *main()* into an executable cyclic executive program with the GNU toolchain, also included with the IDE distribution.

The Arduino IDE employs the program *avrdude* to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firmware. By default, avrdude is used as the uploading tool to flash the user code onto official Arduino boards.

Introduction

Ultrasonic sensors are great tools to measure distance without actual contact and used at several places like water level measurement, distance measurement etc. This is an efficient way to measure small distances precisely.

Ultrasonic Sensor Module:

Ultrasonic sensor HC-SR04 is used here to measure distance in range of 2cm-400cm with accuracy of 3mm. The sensor module consists of ultrasonic transmitter, receiver and the control circuit. The working principle of ultrasonic sensor is as follows:

1. High level signal is sent for 10us using Trigger.
2. The module sends eight 40 KHz signals automatically, and then detects whether pulse is received or not.
3. If the signal is received, then it is through high level. The time of high duration is the time gap between sending and receiving the signal.

Distance= (Time x Speed of Sound in Air (340 m/s))/2

In the circuit diagram, Arduino pin13 is connected to one terminal of the speaker. Other terminal is connected to ground. Trigger pin of ultrasonic sensor is connected to pin number of 7 of Arduino. Echo signal is connected to pin number 6 of Arduino.

Timing Diagram:

The module works on the natural phenomenon of ECHO of sound. A pulse is sent for about 10us to trigger the module. After which the module automatically sends 8 cycles of 40 KHz ultrasound signal and checks its echo. The signal after striking with an obstacle returns back and is captured by the receiver. Thus the distance of the obstacle from the sensor is simply calculated by the formula given as

Distance= (time x speed)/2.

Here we have divided the product of speed and time by 2 because the time is the total time it took to reach the obstacle and return back. Thus the time to reach obstacle is just half the total time taken.
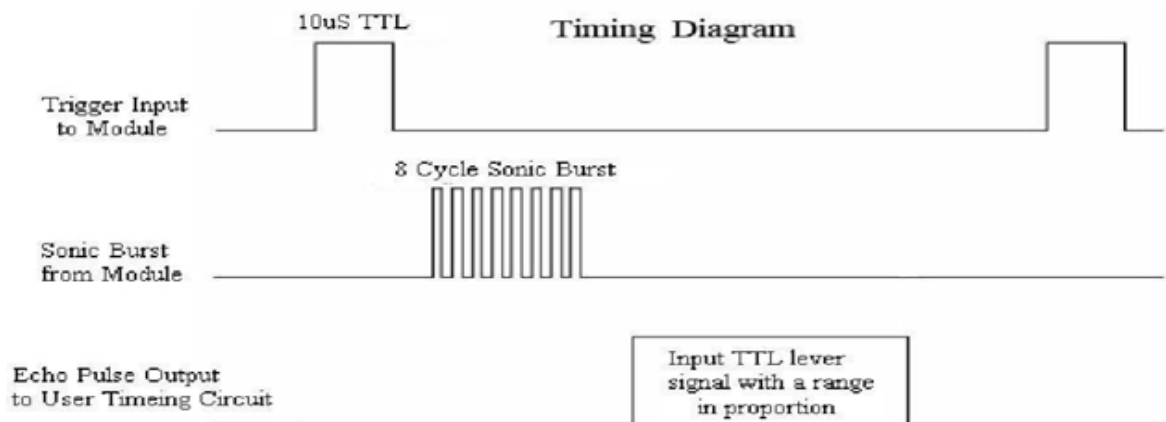

Fig:1 Timing Diagram

Program /Code:

```
const int echoPin = 4; // Echo Pin of Ultrasonic Sensor

const int pingPin = 5;// Trigger Pin of Ultrasonic Sensor

const int buzzer= 12;

const int LED = 6;

void setup() {

 Serial.begin(9600); // Starting Serial Communication

 pinMode(pingPin, OUTPUT); // initialising pin 7 as output

 pinMode(echoPin, INPUT); // initialising pin 6 as input

 pinMode(buzzer,OUTPUT);

 pinMode(LED,OUTPUT);

}

void loop(){

 long duration, inches, cm;

 digitalWrite(pingPin, LOW);

 delayMicroseconds(2);

 digitalWrite(pingPin, HIGH);

 delayMicroseconds(10);

 digitalWrite(pingPin, LOW);

 duration = pulseIn(echoPin, HIGH); // using pulsin function to determine
total time

 inches = microsecondsToInches(duration); // calling method

 cm = microsecondsToCentimeters(duration); // calling method

  Serial.print(inches);
```

```
Serial.print("in, ");

Serial.print(cm);

Serial.print("cm");

Serial.println();

if(inches<=30){

  digitalWrite(buzzer, HIGH);

  digitalWrite(LED, HIGH);

 }

 else{

  digitalWrite(buzzer, LOW);

  digitalWrite(LED, LOW);

 }

 delay(100);

}

long microsecondsToInches(long microseconds) {

// method to covert microsec to inches

 return microseconds / 74 / 2;

}

long microsecondsToCentimeters(long microseconds)  {

  // method to covert microsec to centimeters

  return microseconds / 29 / 2;

}
```
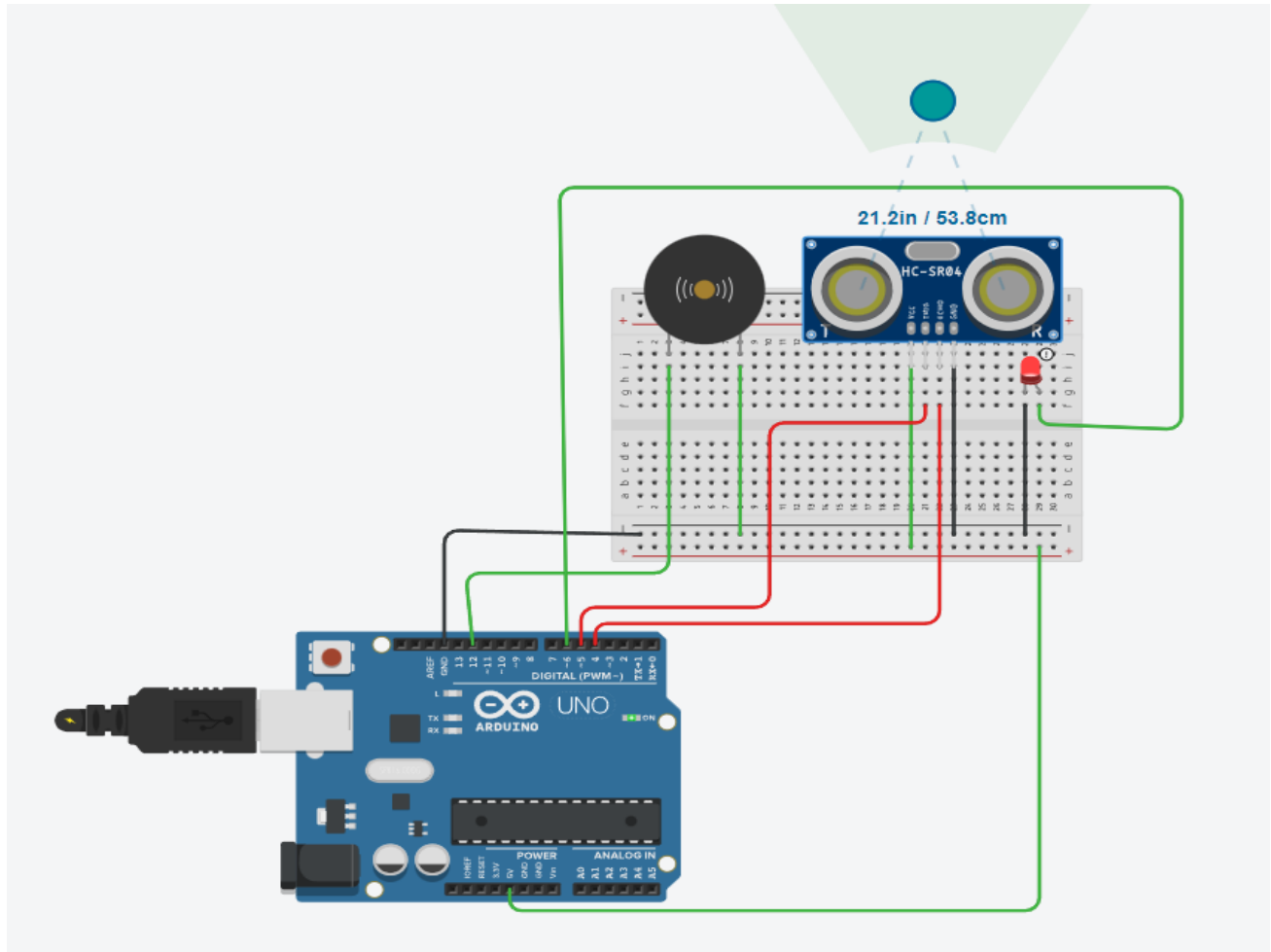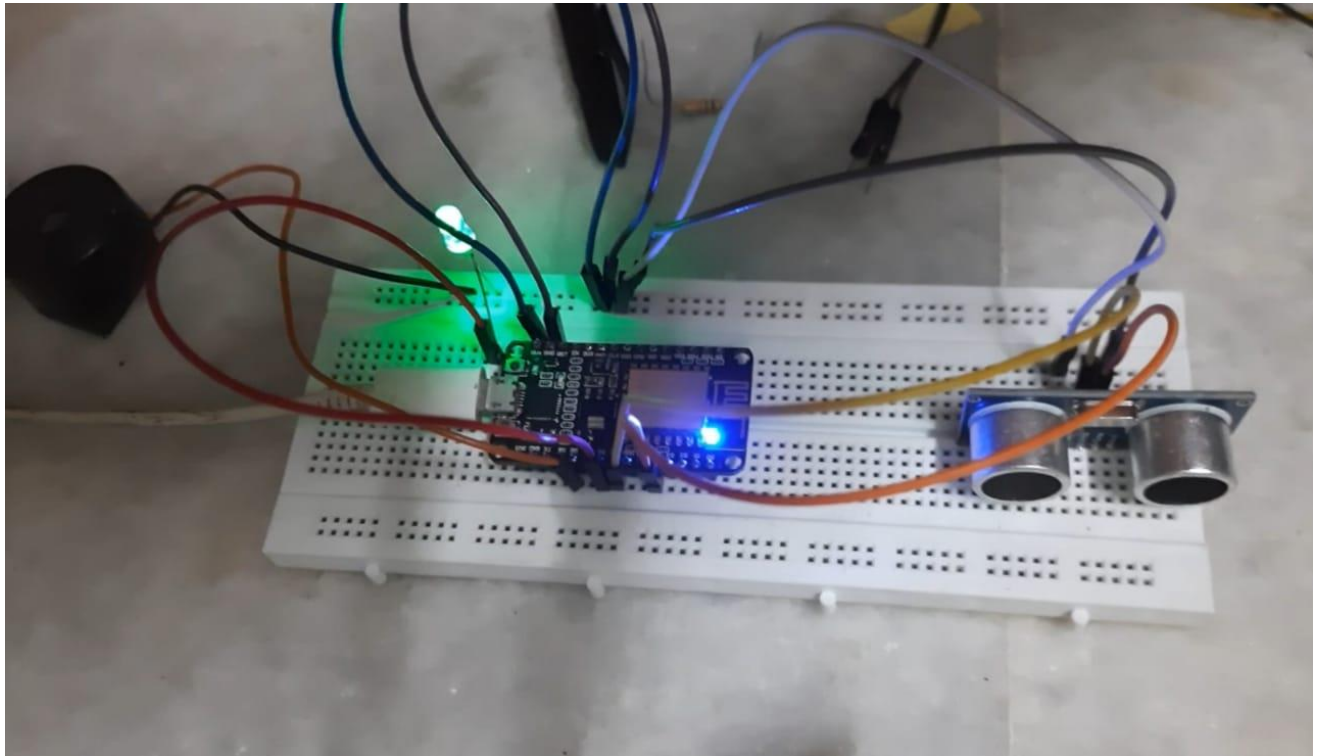
OUTPUT

- Tinker cad simulation

Hardware :

Inference & analysis:

In this project design of Human Proximty Alert System to maintain social distance from others in the pandemic Situation of Covid-19 to maintain our lives as healthy as Possible.

This equipment will help people to maintain safe distance among themselves that ultimately help avoidance of spreading coronavirus. This model is the integration of the proximity sensor and an alarming mechanism. This prototype has been tested on a toy for validation purposes

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Result:

We Successfully designed or implemented design of Human Proximity Alert System To maintain social distance from others in the pandemic Situation of Covid-19 to maintain our lives as healthy as Possible.

Conclusion:

In this project design of Human Proximity Alert System With the help of Nodemcu Microcontroller and Arduino Platform. In this Ultrasonic Sensor Will be Used to Sense the data. And a buzzer and LED Will Shows Warning Signal When Somebody Comes Closer to the sensor.