

CHAPTER-1 :Introduction

In this project, we will design a simple radar application using Arduino and Processing.

Arduino radar project implemented with the help of processing.

Radar is long range object detection system that uses radio waves to establish creatin parameters of an object likes its range , speed and position , radar technology is used in aicrafts missiles, marine, wethere prediction and automobiles.

Project Goal : - Arduino is a single-board microcontroller to make using electronics in multidisciplinary projects more accessible.

Useful for security and protection and can reduce some accidents.

Use radio waves to determine the range,altitude and direction of objects.

1.1 scope:

What it can do:-

Our project is most important thing in airlines, submarine, and marine. It is detect the object and when it is detect the object then the buzzer is ring and we are alert the object is in our area

What it can't do:-

In this project we use only RADAR and BUZZER it cannot saw that object's picture but in future we edit this thing.

CHAPTER-2: SYSTEM ANALYSIS

2.1 HARDWARE REQUIRED:

Arduino Uno
Hc-Sr04 Ultrasonic Sensor
Servo Motor
Jumper cables
Breadboard
Buzzer
USB cable to connect with the Arduino board to the computer

2.1.2 DETAILS ABOUT HARDWARE:

ARDUINO: Arduino is a user community that designs and manufactures single board microcontrollers and microcontroller kits for building digital devices.

BREAD-BOARD: The Arduino UNO is an open-source microcontroller board based on the ATmega328P microcontroller. It is interconnected by inserting their leads or terminals into the holes and then making connections through wires where appropriate.

HC-SRO4: Its stable performance makes it a popular module in the electronic market.

BUZZER: A buzzer or beeper is an audio signaling device which may be mechanical, electromechanical or piezoelectric.

JUMP-CABLES(wire): A jump wire is an electrical wire, or group of them in a cable, with a connector or pin at each end which is normally used to interconnect the components of a breadboard. Hc-SrO4- Its stable performance makes it a popular module in the electronic market. Compared to the Sharp IR ranging module, it has ranging accuracy and longer ranging distance.

HC-SRO4: The Hc-Sr04 ultrasonic sensor uses SONAR to determine the distance of an object just like the bats do.

SERVO MOTOR: A servomotor is a rotary actuator or linear actuator that allows for precise control of angular or linear position, velocity and acceleration.

2.2 SOFTWARE REQUIRED:

Arduino IDE 1.8.9 used for setting up code in the Arduino.

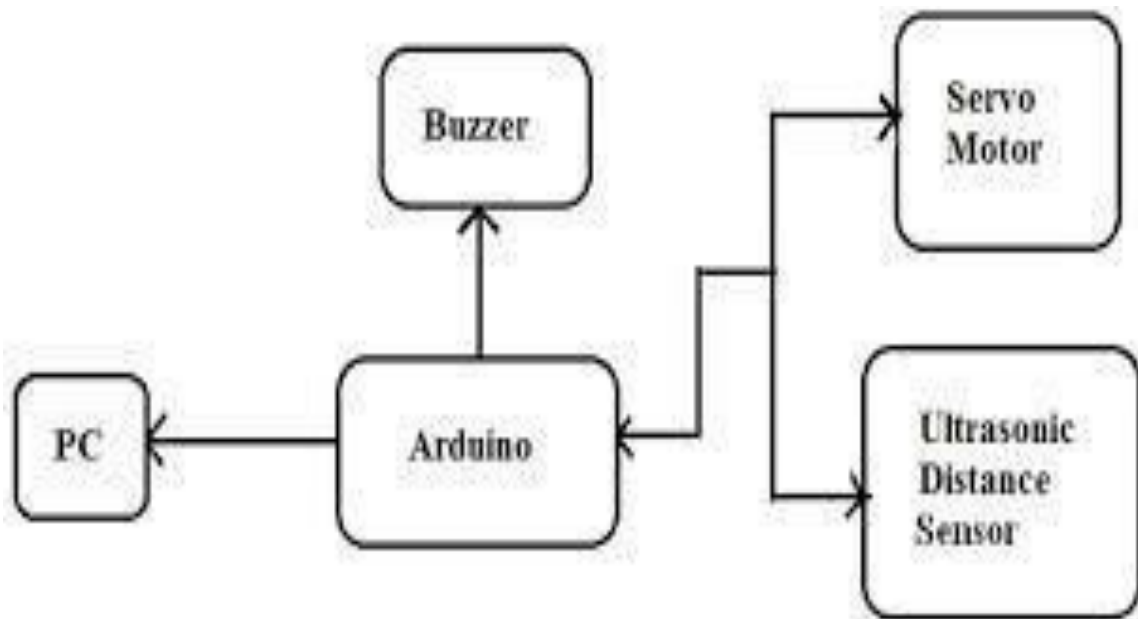
Processing IDE used for rotate the ultrasonic sensor.

2,2,1 DETAILS ABOUT SOFTWARE:

ARDUINO IDE: The open-source Arduino Software (IDE) makes it easy to write and understand the code and upload it to the board. It easy to write and understand the code and upload it to the board.

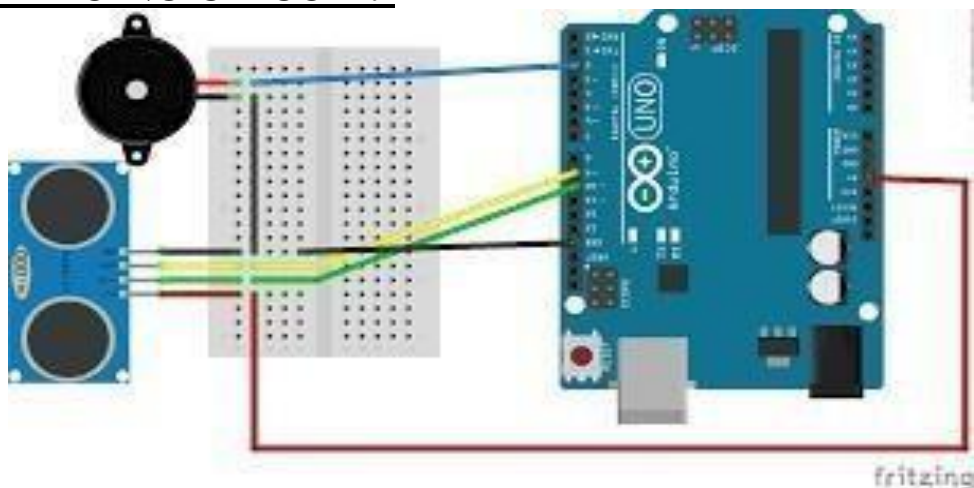
CHAPTER– 3: SYSTEM DESIGN

3.1 PROJECT FLOWCHART:-



3.1 (PROJECT FLOWCHART)

3.2 ARDUINO CIRCUIT:-



3.2 (ARDUINO CIRCUIT)

CHAPTER – 4: IMPLEMENTATION

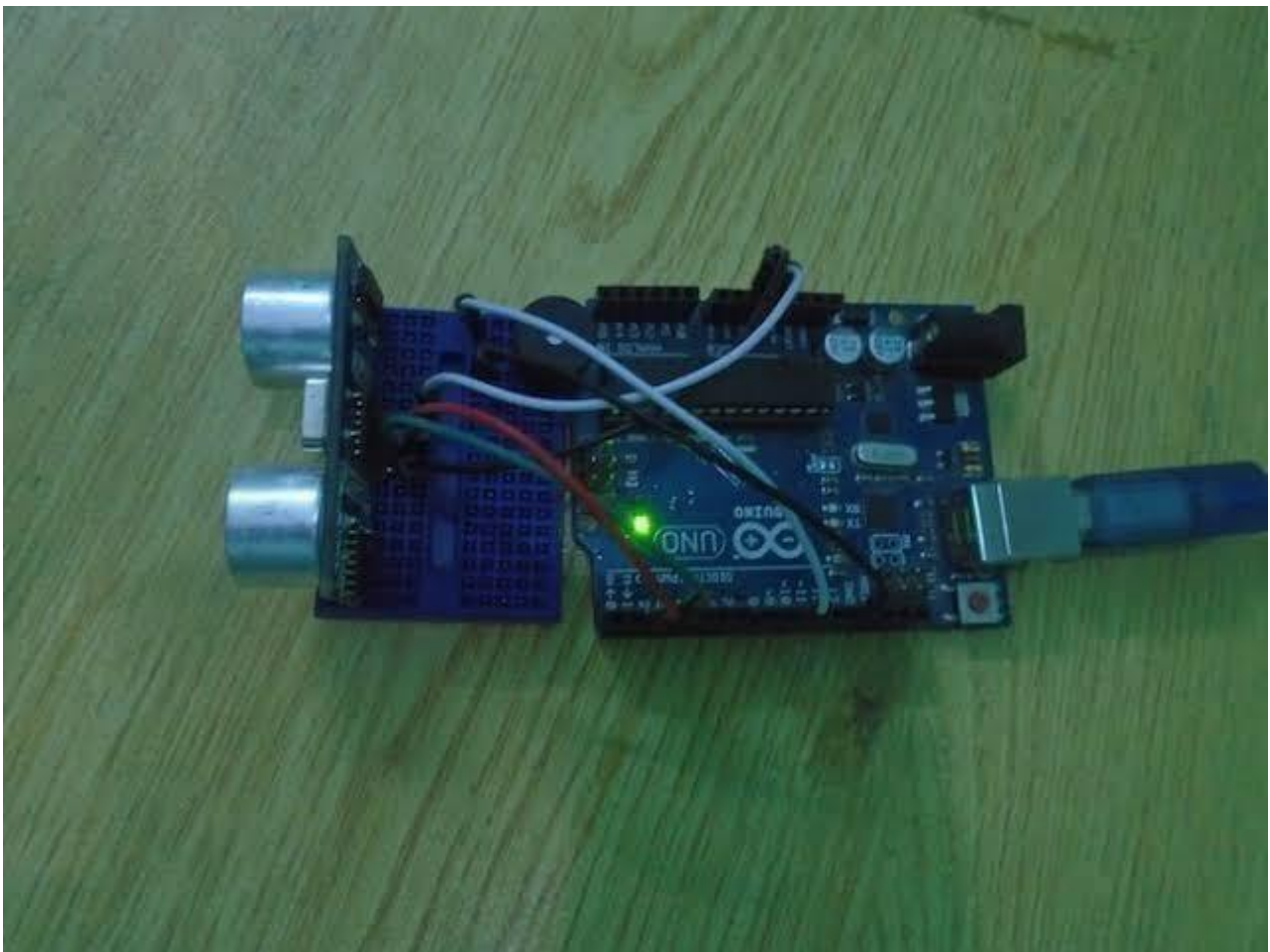
4.1 IMPLEMENTATION ENVIRONMENT:-

This project is help to understand ultrasonic and buzzer and go deeper into learning Arduino,follow these steps & give me feedback please.

4.2 STEPS of PROJECT:-

Step 1:-

First of all we connect the jumuping wires in Arduino and connect the circuit with pc through Arduino wire.to connect hardware to voltage between



4.1 (ARDUINO CONNECTION)

Step 2:-

Open Arduino application



```

Arduino_code

#include <Servo.h>.
const int trigPin = 8;
const int echoPin = 9;
const int buzzer = 10;
// defining time and distance
long duration;
int timer;
int distance;
Servo myServo; // Object servo
void setup() {
  pinMode(trigPin, OUTPUT); // trigPin as an Output
  pinMode(echoPin, INPUT); // echoPin as an Input
  pinMode(buzzer, OUTPUT); // buzzer is output
  Serial.begin(9600);
  myServo.attach(11); // Pin Connected To Servo
}

void loop() {

  for(int i=15;i<=165;i++){
    myServo.write(i);
    delay(30);
    distance = calculateDistance();

    Serial.print(i);
    Serial.print(",");
    Serial.print(distance);
    Serial.print(".");
  }
  // Repeats the previous lines from 165 to 15 degrees
  for(int i=165;i>15;i--){
    myServo.write(i);
    delay(30);
    distance = calculateDistance();
    Serial.print(i);
    Serial.print(",");
    Serial.print(distance);
    Serial.print(".");
  }
}

int calculateDistance(){

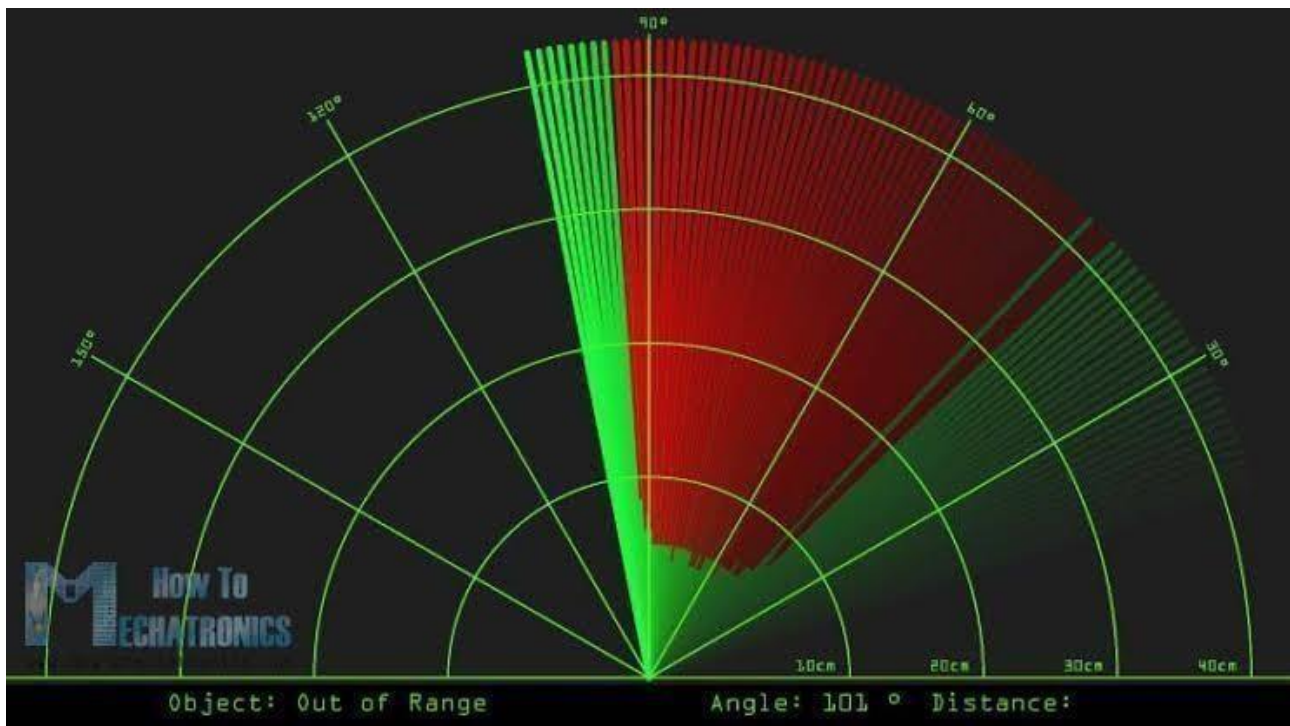
```

4.2 (ARDUINO CODE SCREEN SHOT)

Step 3:-

The UART is connected to the Arduino which is used to transfer the data between the Arduino and the PC system. When the object is detected, it replicates the waves that are received by the receiver which is present in the sensor. Then, the reflected signal is guided back to the Arduino and to the computer system and the presence of the object will be displayed in the rotating RADAR screen.

Run the code and observation the graph.....



4.3 (ARDUINO GRAPH)

When the object is detected, the screen will display the presence of the object and the angle and distance of the object.

CHAPTER– 5: CONCLUSION AND FUTURE:

ARDUINO is the most important in this project.

As future work, use increasing in machinery and range of Arduino's rang and better type of sensor we using and we give a one type of automatic power supply.

This project can be used for security purpose for the safety of human by detecting object interference in a given range of distance.

Finally, the project has been effectively instigated and desire of the project is accomplished without any discrepancy.

Since this project has many security values, the future scope for this project is high.

For many applications, this can be used as the base material.

It can also be technologically advanced or reformed affording increasing to the increasing necessities and future demands.

:- REFERENCES

- <https://www.instructables.com/id/Arduino-Distance-Detector-with-a-Buzzer-and-LEDs/>
- <https://create.arduino.cc/projecthub/ammaratef45/detecting-obstacles-and-warning-arduino-and-ultrasonic-13e5ea>
- <https://howtomechatronics.com/projects/arduino-radar-project/>
- <https://howtomechatronics.com/projects/arduino-radar-project/>
- <http://www.toptechboy.com/arduino/lesson-20-arduino-lcd-project-for-measuring-distance-with-ultrasonic-sensor/>