IOT ACTIVITY BASED LEARNING REPORT
ON
Radar system using arduino and processing software

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Semester	6th
Date	15th 2022

Aim - To build a radar using arduino and processing software

Software Required- Arduino IDE ,Processing4

Hardware Required - 1. Arduino UNO R3 board
2. Servo Motor(SG-90)
3. Ultrasonic Distance Sensor(HC-SR04)
4. Jumper wires
5. Laptop

Theory

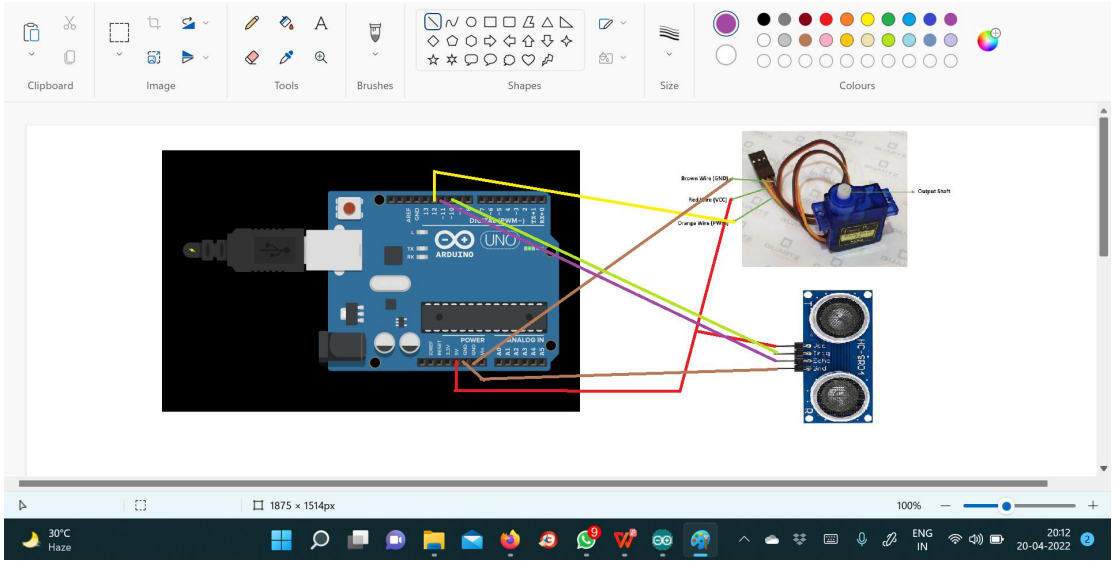
We are using an ultrasonic distance sensor which is mounted on a top of a servo motor and the whole system is called a radar

A radar is an electromagnetic sensor used for detecting, locating, tracking, and recognizing objects of various kinds at considerable distances. It operates by transmitting electromagnetic energy toward objects, commonly referred to as targets, and observing the echoes returned from them.

Circuit Diagram

Servo
Red wire - 5V
Brown - GND
Yellow - 12 pin

Ultrasonic Distance Sensor
Vcc - 5V
GND - GND
Trig- pin 10
Echo - 11



ARDUINO CODES

sketch_apr20a | Arduino 1.5.5-r2

File Edit Sketch Tools Help

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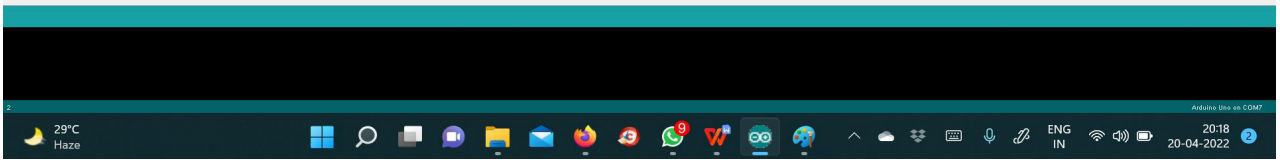
```
#include <Servo.h>.
const int trigPin = 10;
const int echoPin = 11;
// Variables for the duration and the distance
long duration;
int distance;
Servo myServo;
void setup() {
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  Serial.begin(9600);
  myServo.attach(12);
}
void loop() {
  // rotates the servo motor from 15 to 165 degrees
  for(int i=15;i<=165;i++){
  myServo.write(i);
  delay(30);
  distance = calculateDistance();

  Serial.print(i);
  Serial.print(",");
  Serial.print(distance);
  Serial.print(".");
  }
```



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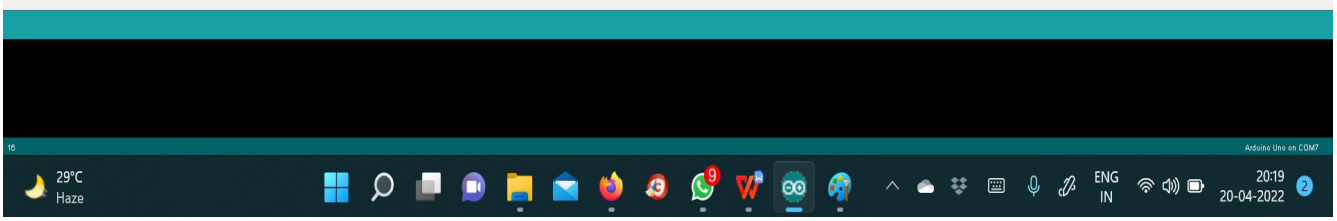
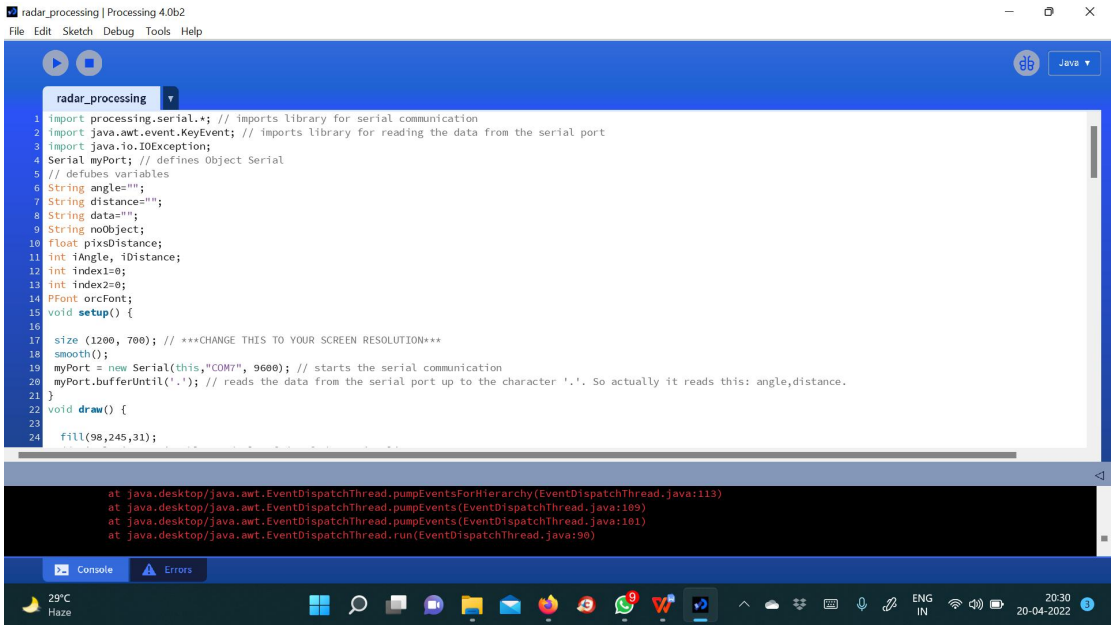
```
  }
  // Repeats the previous lines from 165 to 15 degrees
  for(int i=165;i>15;i--){
  myServo.write(i);
  delay(30);
  distance = calculateDistance();
  Serial.print(i);
  Serial.print(",");
  Serial.print(distance);
  Serial.print(".");
  }
}
// Function for calculating the distance measured by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

  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  // Sets the trigPin on HIGH state for 10 micro seconds
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin, HIGH); // Reads the echoPin, returns the sound wave travel time in microseconds
  distance= duration*0.034/2;
  return distance;
}
```



Processing Code



Rest of the code give in seperate binary file.....

Observation

Video clip attatched

Conclusion

Radar system using arduino and processing 4 software was successful.