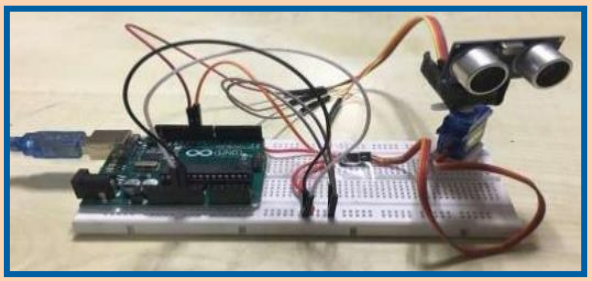
ArduinoBasedUltrasonicRadar



UndertheSupervisionof

SKMP PROJECT MANAGEMENT TEAM&SUPERVISER

DEPARTMENT
OF SKMP GROUP

Under the supervision of:-

SKMP PROJECT
MANAGEMENT
TEAM AND
SUPERVISER
OFFICER

PREPARED FOR:-

DIPLOMA STUDENT GROU
SEM
BALASORE SCHOOL OF
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CERTIFICATE

THISISTOCERTIFYTHESTUDENTOF6THSEMESTER(COMPUTERSCIENCE&ENGG.) HAVE COMPLETED OUR PROJECT WORK TITLED "ARDUINO BASED ULTRASONIC RADAR" SATISFACTORILY IN PARTIAL FULFILMENT OF REQUIREMENT OF DIPLOMA COURCEIN THEYEAR2021-2024.

Date:

(Er. Priyanka Panda)
Head of the Department

(SKMP PROJECT MANAGEMENT SUPERVISER)
(Guide)

(InternalExaminer)

(ExternalExaminer)

CANDIDATE'S DECLARATION

Ideclarethatsemesterreportentitled "ArduinoBasedUltrasonic Radar"ismyownworkconductedunderthesupervisionoftheskmp project management department team and superviser

I further declare that to the best of my knowledge the report for diplomafinalsemesterdoesnotcontainpartoftheworkwhichhasbeen submitted for the award of diploma either in this or any other college without Balasore School of Engineering, Ranipatna, Balasore.

SING OF SKMP PROJECT MANAGEMENT
SUPERVISER / MD(managing director)

GUIDE CERTIFICATE

This is to certify that the project report entitled "Bluetooth ControlledCarwithArduino"submittedbyAlltheStudentsof Comp. Sc& Eng. Partial fulfillment of their work for the award Diploma (Sem-6) of Balasore School of Engineering, Balasorehas been completed under skmp project management team supervision & guidance.

Tothebestofmyknowledgethematterpresentedbythemisoriginal in nature and not bee.

SING OF SKMP PROJECT MANAGEMENT
SUPERVISER / MD(managing director)

Acknowledgment

This project was completed for the coursework of Diploma final year project, directed by the Department of Computer Science and Engineering, BalasoreSchool of Engineering. Our sincere efforts have madeus accomplish the task of completing the project. Most importantly, we would like to express ourgratitudeskmp project management department team for his advice and valuable comments regarding our project, which led us to the completion of the project. Our thanks and appreciation also goes to our classmates, who encouraged us to complete our project.

SING OF SKMP PROJECT MANAGEMENT
SUPERVISER / MD(managing director)

Abstract

As we know that Radar is an electronic device which consists or contains radio waves to detect the object means to find the distance, angle of the object and range as we know the radar is radio detection and ranging. So, In this project we use ultrasonic sensors in place of radar because both work the same but the main difference is that the ultrasonic sensor uses sound waves to find, detect thedistance, angle of velocity and range of the object. So, In this project we will usean ultrasonic sensor, servo motor and Arduino. Now servo motor is used to rotate the ultrasonic sensor and arduino used for the processing of our project, all with this we also used two software that is Arduino IDE and other is Processing app. In this weuseArduino IDE to embed the code in arduino and with theprocessing app we process our project. So, In this project we will show how our projects work and show, detect the distance and angle of the object and how it is shown on the pcwith the help of an arduino and ultrasonic sensor. There is small kind of the information that wewillgiveontheabstract that in this project we put some object ahead of the ultrasonic sensor but when there is no object it will show only green graph only on the screen and not shown any thing in any position but when we put some object in some position than when the ultrasonic sensor means radar comes ahead of this object it will show a red lines on this graph on this position and also shows angle , distance of this object which is basically made for local patch areas like our borders.

CONTENTS

CHAPTER1

Introduction

Firstly in this report we introduce our project which is Arduino based Ultrasonic Radar. We explain all the main points and all the parts of our project alsowith its hardware and software. So, we will start withRadar. Radar is an electronic device which uses radio waves to find, detect therange, distance and angleoftheobject. Nowfirstwewill tell whyweuseultrasonicsensorin place of Radar because if we focus on the working of both of these than we assume that its same but only the difference is that Ultrasonic Radar uses sound waves because there are soft fabric layer on Ultrasonic radar that consume more sound wave so, it uses sound waves to detect the distance, angle and range.

Now if we focus on the software weuse two softwareone name is Arduino IDE, with the help of thisweembed the code inourarduinoandtheothernameisProcessingappwhichisusedforthe processing of our project. Now nextcomes to its implementation as we know that in arduinotherearefourteendigitalpins,eightanaloguepins,onepin,onesetreset, oneanalogue reference, one 3v, one 5v and three pins are ground and if we see in side of Ultrasonic sensor there are four pins total that is echo, trig,Vcc and ground. Also there are three connections in our servo motor signal, negative voltage and positive voltage.

Then we come to the working of our project where all the connections finish and our ultrasonic start working means start to rotate with the help of the servo motor. If there is no object in the range of the radar than it will show only a green line and green graph in the pc screen, but if we put some object in the range of the radar means ultrasonic sensor so, when it comes ahead of the object than it will show a red line in the graph with distance, range and angle of the object. So, our project is basicallyused in local path areas to detect theobject distance, range and angle.

Objective

The objective and goal of our project is that to detect the object in the range and pass the information to the Arduino microcontroller by adjusting the rotation of the servomotor, we allow the sensing to be in range from 0 to 150 degree. It can detect objects up to 400cm away from the ultrasonic sensor.

>> This project is basically used for the local patch areas means to detect the local objects range if we focus on the main functionalityof our project that we seen that this is very helpful for near border villages or houses also in army bunkers because it not helps to detect enemy location but also not affected by any type of environment.

>>So,themainobjectiveofourprojectistofindthelocationmeansdistance,rangeandangle of the object or any things which come in range of the radar. We also think of making it as an advancedversionoradvancedthingsthatarealsousedatahigherlevel.So,thisproject helpful orused by ourarmysoldiersfor patrolling. So, thesearethemain objectives of the project.

1. TobuildupanultrasonicRADAR.
2. Toidentifythefixedormovingitem.
3. Toquantifythedistanceofthearticlefromtheframework.
4. Togaugethepointofthemovingarticle.
5. Diminishing human time and exertion.

ProblemStatement

Since, electronic segments when used to shape any circuit require some measure of investigating to make the circuit work as indicated by our desires. In our task, there were a few issues that we needed to manage.

Scope

There are a lot of scopes to develop our project. If we can use wireless Ultrasonic sensors it is possible to cover a full surrounding area. We can also see the object that come in the coverage area of radar by using a camera

Methodology

To check the working of this undertaking, after its arranging, advancement and programming we putbarelyanyarticlesbeforetheultrasonicsensor.Astheultrasonicradarmoveswiththehelp of a servo motor, our screen started to show the yield through getting ready IDE. From this time forward, when the sensor crosses the article then in the pc screen it shows a red portion with the distance and point where the thing is paced. The essential thing was gotten at the distance of 30.5cm assessed through a ruler and the system assessed the distance at 32cm.While the ensuing article was set a ways off of 20 cm and the structure assessed it as 21cm. Subsequently thedecided efficiency wound up being 95%. Here, as it is shown the controller we are using is Arduino,withthedataUltrasonicsensorandthe yieldistheservomotorwhichturns180 degrees. The microcontroller controls all the exercises of this system, from turn of the motors to the obstruction revelation of the ultrasonic and depiction of the result on the screen.Here, it tendsto seehowtheworkcycleinthisradarsystem.Thesensorwillrecognizetheobject distance and angle easily with the help of ultrasonic radar because as we know ultrasonic sensors are very sensitiveandeasilydetectthedeepobjects.Allthesedistance,rangeandanglecanbeshownon

our pc screen in which the rduino is connected. This all working de[pend uponthe two software's oneisArduinoIDEandotherisprocessingapp. Inarduinoweembedthecodeinarduinoandwith the processing app we help to process the project means ultrasonic radar. So,this is the workingof the project.

Applications

There are many types of applications of our project but we take some real life examples and that are very useful for our country and safety. Also in the coming time this project will be used in advance. In our project there are lots of instruments or components that are used in every electronics project intoday time. So, if we focus on the main application of our project that is in the Air Force, Naval and Army. Our project is not only used in this field but also used by car companieslikeford,audiandtexas.Thesetypesofprojectsarealsopromotedbygoogle.So these are the important applications.

ApplicationinAirForce

In flight, airplanes are outfitted with radar gadgets that caution airplanes or different deterrents in or moving toward their way, show climate data, and give exact elevation readings. The main business gadget fitted to the airplane was a 1938 Bell Lab unit on some United AirLines aircraft. Such airplanes can land in mist at air terminals furnished with radar-helped ground-controlled methodologyframeworks in whichtheplane'sflight is seenonradarscreenswhileadministrators radio landing headings to the pilot.

NavalApplication

Marineradarsareusedtomeasurethebearinganddistanceofshipstopreventcollisionwith other ships, to navigate, and to detect the location. This helps our navy with the help of this. It is also easy to find the enemy marine underwater because it also works under water and never gets affected bythe temperature. So, this is also the main application of our project.

ApplicationinArmy

Two camcorders naturally recognize and track the enemy easily. This will really help our army. This project is specially made for this purpose because it is used in night patrolling and detects easily theenemyandmanytypesofmovementsthatmakeiteasyforoursoldierstodetectthe

location and range of the enemy. Also this is used in borders for the safety of army bunkers, weapons and localpatch areas. So, this is also the most important application of our project.

MeteorologicalApplications

In Meteorology this is used for the purpose to monitor precipitation and wind. It is used as the main part to know the weather condition means this is also used for short term weatherforecasting and also used for severe weather like heavy rain, storms and wind etc. This is alsoused by geologists for the mapping of earth crust.

Working

In this part weareexplainingtheworkingofour project. Firstlyweimplement all the components and write the codes in our softwares. Then in the next part we connect our project with the personal computer or laptop. Now it starts working. Our radar means the ultrasonic sensor moves with the help of a servo motor. It covers the surrounding areas easily. Now, in the nextitnotes and records the movement and detects the objects ifthere is no object it shows onlya green graph and a green line in this graph this is all with the help of arduino. Then we try to check its main working so we put an object ahead of our radar or ultrasonic sensor and when our radar comes in front of this object it will show the red line over the green graph in the pc screen and also shows the distance, angle and range of the object.

Thereisnochanceofstuckandlagginginworkingifusethebestarduinomodel,thereisno loose wiring and also not error in coding because sometimes there are a little error means to find distance, range and angle there is code and with a little mistakes it will gave a little bit error in values. So, if you tryto make this project mainly focus on the code that you write and the wiring. So, this is the working of the project.

AdvantagesoftheProject

It does not get affected by any type of color and transparency. As we know thatultrasonic sensors transmit the sound off of the object, So its transparency or transparency does not affect the radar viewing. It works in any dark environment so we can also use this projectinto advanced levels like night patrolling purposes. Also, it does not get affected by rain, snow, dust and snow. The other advantage is that this project is made with ultrasonic sensor so it has high sensitivity and high frequency so it is easy to detect the deep objects and there is also a self cleaning system in this project. So, these are the advantages of Arduino Based Ultrasonic Radar.

LimitationsoftheProject

The limitations of this project are like there is very soft fabric in the ultrasonic sensor so it absorbs more sound waves so it is tough or hard to detect that kind of objects that are covered with soft fabric. This project uses sound waves and conducts the sound to work continuously soit does not work in a vacuum because there is no air for the sound from its travel through. The other main disadvantage is that it’s detection range, which is dependent on the quality of the ultrasonic sonic sensor, is used in the project. So, these are the main disadvantages of Arduino Based Ultrasonic Radar.

CHAPTER2

OVERVIEWOFTHEPROJECT

TheoryofOperation

This application of the ultrasonic radar is mainly based on the sound waves because as we know that radar is used radio waves as the name radio detection and ranging we understand that radar usesradiowavestodetecttheobjectdistance,rangeandangle. Sohereweuseultrasonicsensors as a radar and it uses Sound waves to detect the object range and angle. The main objective ofourproject to coverthenearbyareas means local patchareas as behind wearestudyingabout the workingand application ofthis project sioithinkthis is easilyunderstandableto all ofus what is the overview of this project. This project is mainly used for night patrolling because ultrasonic sensors easily detect the object because it is a very sensitive component but one main disadvantage of our project is that it makes continuously sound because there is soft fabric in ultrasonic sensor and it is absorb more amount of sound waves so it makes continuously sound.

In coming this project is also used in robots, in cars and in our mobiles as a gps system to locate our exact or current location, in robots to navigate the map and to show the live location video. In cars this is used in car parking or when we try to back our car sometimes and there is wall behind the car so sometimeslittle accidents happen so in today's time many of the companies use the advanced version and use the sensor to detect easily and give a beep soundthis will be used as a safety purpose. This project is also used in weather forecasting and prediction of the thunderstorms and heavy winds. This project is not only used in these purposes but also used by our army, air force purpose to detect the enemy tanks, missiles etc. The basic range of this radar is to detect two hundred meter but if we tryto put this in an advanced version and tryto convert this project in advance it will easilycover the distance of four hundred meters.

The idea

The idea of this project mainly comes from our indian armed forces means this is basically used for safety purposes by our army, airforce. Also but in today's time this technology is used in advanced ways such as in car companies like audi, ford etc. Also we want to make this project withsomechanges. Wewanttohandlethisonourmobilelikehomeautomation.Thishelpsusto patrol from anywhereand also work as aGPS system. So, as wemain focus on ourproject this is already built by many of the field but we try to make it with some changes. So, this is the idea about this project.

HistoricalBackgroundof Radar

The historical backdrop of radar (where radar represents Radio Detection and Ranging) began with tests in the 19th century that indicated that in radar the radio waves are backward or means to transmit or receive the radio waves bymetallic articles. This chance was proposed in the original work on electromagnetism. In any case, it was not until the early20th centurythat systems able to use these principles were becoming widely available, and Also in history it is not much developed and only used as a radar to detect the location.If we focus on itshistorical background, we can see only the main use of radar but in this time it is mainlydone by arduino and some types of sensors that can easily detect the deep objects. So, this is the historical background of our project or radar.

Introduction

Themain goal ofourprojectistousetheultrasonicsensorwhichisconnectedtothearduinouno board and the sensor will give the signal in which the arduino transfers it to the screen and that signal is shown in the screen of the laptop. Which is veryhelpful to calculate the presence of any object in front of the radar as well as shows the range, angle and distance where that object displaced or located.

Technologicaloverview

In the Technical overview we explain thatinthisproject both hardware and softwareare used. So, in the technological overview this project is well maintained by both the hardware and software. In which softwares we used and what are the main components that we use in our project. So, firstlywestartwiththesoftwaresthatweuseoneisanArduino IDE whichisused

to embed the code in arduino and the other is processing IDE which meansprocessing software in which we write the code and use it for processing our project functionality. Now comes to the hardware system which is Arduino required to connect with pc and transfer the signal with thehelpofotherhardwaresystems such as servo motorwhich is usedtorotateourradarandultrasonicsensorisusedtosense,detecttheobjectlocation, range and angle. This is the technological overview of our project arduino based ultrasonic radar.

SoftwareUsed

2.6.1ArduinoIDE

The arduino IDE is a kind of software that is used to embed the code in arduino. Arduino IDE software is onlythe software that is used for the processing in arduino based projects. So, in our project we use this software. In this software we write our programs in two languages that are c and c++. This is also known as open source because as we know that arduino is an open source hardware and software where we work on both platform hardware and software. We can also say that the Arduino integrated development environment is a type of cross platform application written in java language and the name integrated development environment is for the processing of the arduino.

Code Segment

```
//IncludestheServolibrary#include
<Servo.h>.
//DefinesTirgandEchopinsoftheUltrasonicSensorconstinttrig
Pin = 10;
constintechoPin=11;
//Variablesforthedurationandthedistancelong
duration;
intdistance;
ServomyServo;//Createsaservoobjectforcontrollingtheservomotorvoid setup()
{
  pinMode(trigPin,OUTPUT);//SetsthetrigPinasanOutputpinMode(echoP
  in, INPUT); // Sets the echoPin as an Input Serial.begin(9600);
  myServo.attach(12);//Definesonwhichpinistheservomotorattached
}
voidloop(){
  //rotatestheservomotorfrom15to165degrees
  for(inti=15;i<=165;i++){
  myServo.write(i);
  delay(30);
```

```
  distance=calculateDistance();//Callsafunctionforcalculatingthedistance measured by
the Ultrasonic sensor for each degree

  Serial.print(i);//SendsthecurrentdegreeintotheSerialPort
  Serial.print(",");//Sendsadditioncharacterrightnexttothepreviousvalueneeded later in
the Processing IDE for indexing
  Serial.print(distance); // Sends the distance value into the Serial Port
  Serial.print(".");//Sendsadditioncharacterrightnexttothepreviousvalueneeded
laterintheProcessingIDEforindexing
  }
  //Repeatsthepreviouslinesfrom165to15degrees
  for(inti=165;i>15;i--){
  myServo.write(i);
  delay(30);
  distance=calculateDistance();
  Serial.print(i);
  Serial.print(",");
  Serial.print(distance);
  Serial.print(".");
  }
}
//FunctionforcalculatingthedistancemeasuredbytheUltrasonicsensorintcalculate
Distance(){

  digitalWrite(trigPin,LOW);
  delayMicroseconds(2);
  //SetsthetrigPinonHIGHstatefor10microseconds
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin,LOW);
  duration=pulseIn(echoPin,HIGH);//ReadstheechoPin,returnsthesoundwavetravel time in
microseconds
  distance=duration*0.034/2;
  return distance;
}
```

2.6.2Processing Software

Processing software is a kind of software that is required for the main functioning of the project. In which we are required to writethe program and perform it. It only allows the java programmingandalsoknownasprocessingintegrationdevelopmentenvironment. As we focus on this name so we can know that it itself creates an inneroutputthatisveryhelpfulforthe project.
This is also used for media labs and for live streaming it is little bit thesameworkasstructuredquerylanguage.So,thissoftwaremeansprocessingintegrationdevelopmentenvironmentisusedinour project.

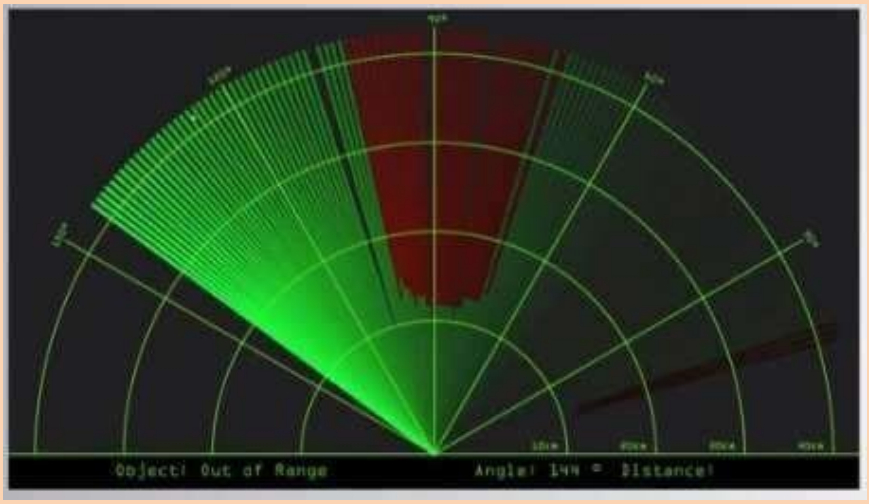
Code Segment

```
importprocessing.serial.*;//importslibraryforserialcommunication
importjava.awt.event.KeyEvent;//importslibraryforreadingthedatafromtheserialport import
java.io.IOException;
SerialmyPort;//definesObjectSerial
// defubes variables
String angle="";
String distance="";
String
data="";StringnoObj
ect;floatpixsDistance
;
intiAngle,iDistance;
int index1=0;
int index2=0;
PFontorcFont;
void setup() {

 size(1200,700);//***CHANGETHISTOYOURSCREENRESOLUTION***
 smooth();
 myPort=newSerial(this,"COM5",9600);//startstheserialcommunication
 myPort.bufferUntil('.');//readsthedatafromtheserialportuptothecharacter'.'.Soactuallyitreadsthis: angle,distance.
}
voiddraw(){

  fill(98,245,31);
  //simulatingmotionblurandslowfadeofthemovinglinenoStroke();
  fill(0,4);
  rect(0,0,width,height-height*0.065);
```

```
  fill(98,245,31);//green color
  //callsthefunctionsfordrawingtheradardraw
  Radar();
  drawLine();
  drawObject();
  drawText();
}
voidserialEvent(SerialmyPort){//startsreadingdatafromtheSerialPort
  //readsthedatafromtheSerialPortuptothecharacter '.'andputsitintotheStringvariable"data". data =
  myPort.readStringUntil('.');
  data=data.substring(0,data.length()-1);

  index1=data.indexOf(",");//findthecharacter','andputsitintothevariable"index1"
  angle= data.substring(0, index1); // read the data from position "0" to position of the variable index1 or thats the
value of the angle the Arduino Board sent into the Serial Port
  distance= data.substring(index1+1, data.length());// read the data fromposition"index1" to the end of the data
prthats the value of the distance

  //convertstheStringvariablesintoIntegeriAng
  le = int(angle);
  iDistance=int(distance);
}
voiddrawRadar(){ pushMatrix();
  translate(width/2,height-height*0.074);//movesthestartingcoordinatstonewlocation noFill();
  strokeWeight(2);
  stroke(98,245,31);
  //drawsthearclines
  arc(0,0,(width-width*0.0625),(width-width*0.0625),PI,TWO_PI);
  arc(0,0,(width-width*0.27),(width-width*0.27),PI,TWO_PI);
  arc(0,0,(width-width*0.479),(width-width*0.479),PI,TWO_PI);
  arc(0,0,(width-width*0.687),(width-width*0.687),PI,TWO_PI);
  // draws the angle lines
  line(-width/2,0,width/2,0);
  line(0,0,(-width/2)*cos(radians(30)),(-width/2)*sin(radians(30)));
  line(0,0,(-width/2)*cos(radians(60)),(-width/2)*sin(radians(60)));
  line(0,0,(-width/2)*cos(radians(90)),(-width/2)*sin(radians(90)));
  line(0,0,(-width/2)*cos(radians(120)),(-width/2)*sin(radians(120)));
  line(0,0,(-width/2)*cos(radians(150)),(-width/2)*sin(radians(150)));
  line((-width/2)*cos(radians(30)),0,width/2,0);
  popMatrix();
}
```

```
voiddrawObject(){
  pushMatrix();
  translate(width/2,height-height*0.074);//movesthestartingcoordinatstonewlocation
  strokeWeight(9);
  stroke(255,10,10);//red color
  pixsDistance=iDistance*((height-height*0.1666)*0.025);//coversthedistancefromthesensorfromcmto pixels
  //limitingtherangeto40cms
  if(iDistance<40){
    // draws the object according to the angle and the distance
line(pixsDistance*cos(radians(iAngle)),-pixsDistance*sin(radians(iAngle)),(width-
width*0.505)*cos(radians(iAngle)),-(width-width*0.505)*sin(radians(iAngle)));
  }
  popMatrix();
}
voiddrawLine() {
  pushMatrix();
  strokeWeight(9);
  stroke(30,250,60);
  translate(width/2,height-height*0.074); // moves the starting coordinats to new location
  line(0,0,(height-height*0.12)*cos(radians(iAngle)),-(height-height*0.12)*sin(radians(iAngle)));
//drawsthelineaccordingtotheanglepopMatrix
  ();
}
voiddrawText(){//drawsthetextsonthescreen

  pushMatrix();
  if(iDistance>40)
  {noObject="OutofRange";
  }
  else{
  noObject="In Range";
  }
  fill(0,0,0);
  noStroke();
  rect(0,height-height*0.0648,width,height);
  fill(98,245,31);
  textSize(25);

  text("10cm",width-width*0.3854,height-height*0.0833);
  text("20cm",width-width*0.281,height-height*0.0833);
  text("30cm",width-width*0.177,height-height*0.0833);
  text("40cm",width-width*0.0729,height-height*0.0833);
  textSize(40);
```

```
text("Radar Project", width-width*0.875, height-height*0.0277);
text("Angle:"+iAngle+"",width-width*0.48,height-height*0.0277);
text("Distance: ", width-width*0.26, height-height*0.0277);
if(iDistance<40) {
text("        "+iDistance+"cm",width-width*0.225,height-height*0.0277);
}
textSize(25);
fill(98,245,60);
translate((width-width*0.4994)+width/2*cos(radians(30)),(height-height*0.0907)-width/2*sin(radians(30)));
rotate(-radians(-60));
text("30",0,0);
resetMatrix();
translate((width-width*0.503)+width/2*cos(radians(60)),(height-height*0.0888)-width/2*sin(radians(60)));
rotate(-radians(-30));
text("60",0,0);
resetMatrix();
translate((width-width*0.507)+width/2*cos(radians(90)),(height-height*0.0833)-width/2*sin(radians(90)));
rotate(radians(0));
text("90",0,0);
resetMatrix();
translate(width-width*0.513+width/2*cos(radians(120)),(height-height*0.07129)-width/2*sin(radians(120)));
rotate(radians(-30));
text("120",0,0);
resetMatrix();
translate((width-width*0.5104)+width/2*cos(radians(150)),(height-height*0.0574)-width/2*sin(radians(150)));
rotate(radians(-60));
text("150",0,0);
popMatrix();
```



OutputfromProcessingSoftware

CHAPTER3

SYSTEMARCHITECTURE

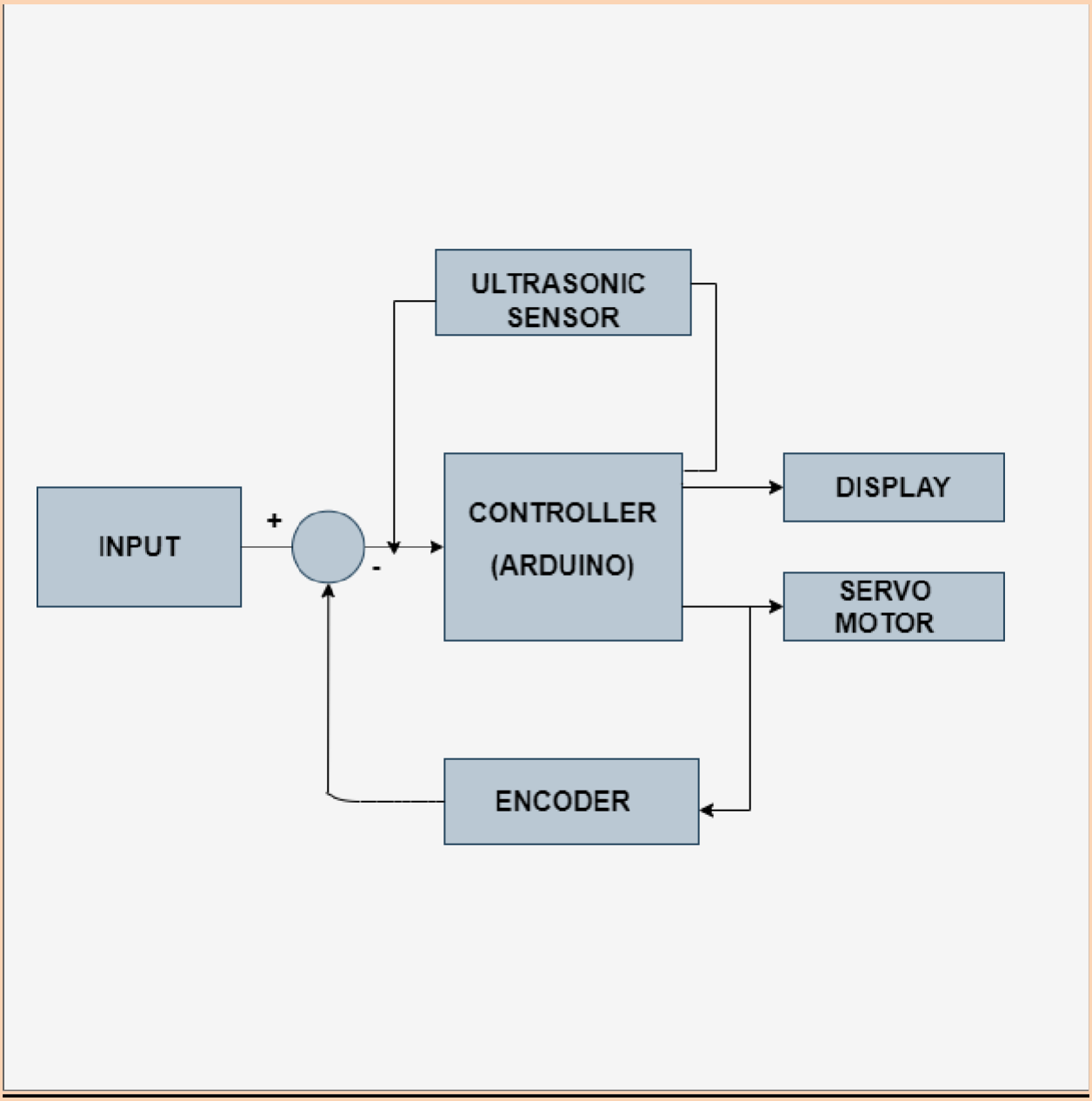


Fig-1ComponentsofRadar Project

BLOCKDIAGRAMDESCRIPTION

The above fig.1 shows the Block Diagram of the short range radar system. Here we use an Arduino Uno microcontroller which is open source to implement an embedded based system. ATMEGA 328 microcontroller sends 10 microsecond pulse width to ultrasonic transmitter, echo back signal received by TXmodule of ultrasonic. After then receive pulse width calculated by the micro controller. Here we use a servo motor on which the ultrasonic module is mounted to receive 180 degree signal. Microcontrollercommunication through with a baud rate of 9600. This protocol works on ASCII values. So calculated distance transmitted from microcontroller . According to sensing different obstacles which are around 180 degree and 250 cm range, visible as a red spot.

ARDUINO

Arduino is the open software hardwareand software which works as both platform hardware andsoftware. Aswefocusonthepinsofarduinothereisfourteendigitalpins,eightanalogpins, three pins are ground pins which is used to ground the circuit, one is set rest pin, one is analog reference pin, one is 3.3 volt pin, one is 5 volts pin and one is power input. If we focus on the otherpartson thearduinoportssothereisonebareejackthatisusedforthepowerinputandrest switch which is used if sometimes there is error in values so we use reset switch. There is ausb port and also in the new version of the arduino there is a wifi connector. We can on off our arduino with a power indicator.

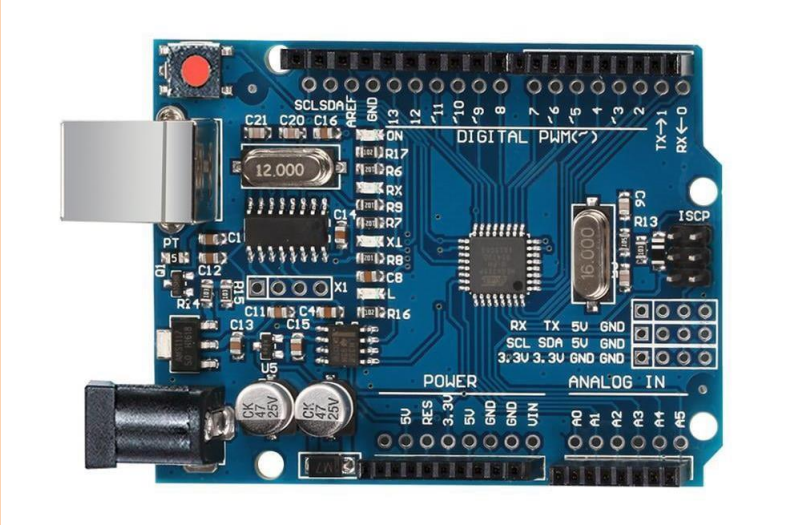


Fig-2ArduinoUnoR3(Microprocessor)

ULTRASONICSENSOR

Ultrasonic sensor is an electronic object which is used in this project. We use ultrasonic sensors inplaceofradar because ultrasonic sensors use sound waves to detect the object the same as radar uses radio waves to find the object distance, angle and range. There is the soft fabric in the ultrasonic sensor so it absorbs the large amount of the soundwaves. So, it makes sound continuously to work continuously. There are the some points that is consist by the ultrasonic sensor.

1)Timeofflight

2)Doppler shift

3)Amplitudeattenuation.

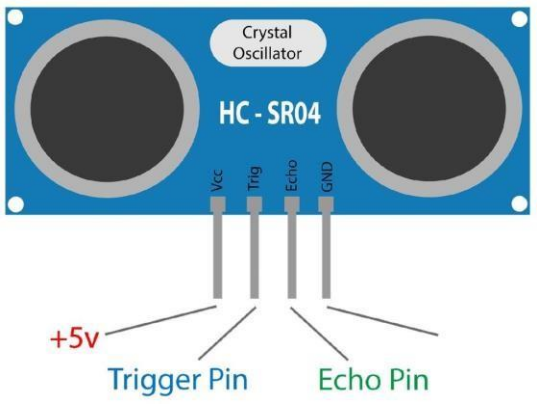


Fig-03UltrasonicsensorHC-SR04

In this we use the model of ultrasonic radar named HC-SR04. This is the best model of the ultrasonic sensor because in which there is a large amount of fabric added to easily sense the object not onlythe day but also in the dark environment and rain ,dustyenvironment.

Below we have given the different values and importantparameters of the ultrasonic sensor. With theseparameterswecaneasilyunderstand the model quality. So in ourprojectweusedthis model of ultrasonic sensor.

SERVOMOTOR

Fig-04ServoMotor

A servo motor is an electrical component that is used in or project. The main use of this component is that it is used to rotate our ultrasonic radar. There are three connections only in servo motors. There is one is negative voltage, one is positive voltage and other is the signal so we can connect all these connections with our ultrasonic sensor means our ultrasonic sensor is mountedovertheservomotor. Insideitthereisamotorwhichisalsousedinremotecontroltoys. Servo motor is basically used in our project to move our ultrasonic sensor. So this is the main purpose of the servo motor in our project.

FLOWCHART

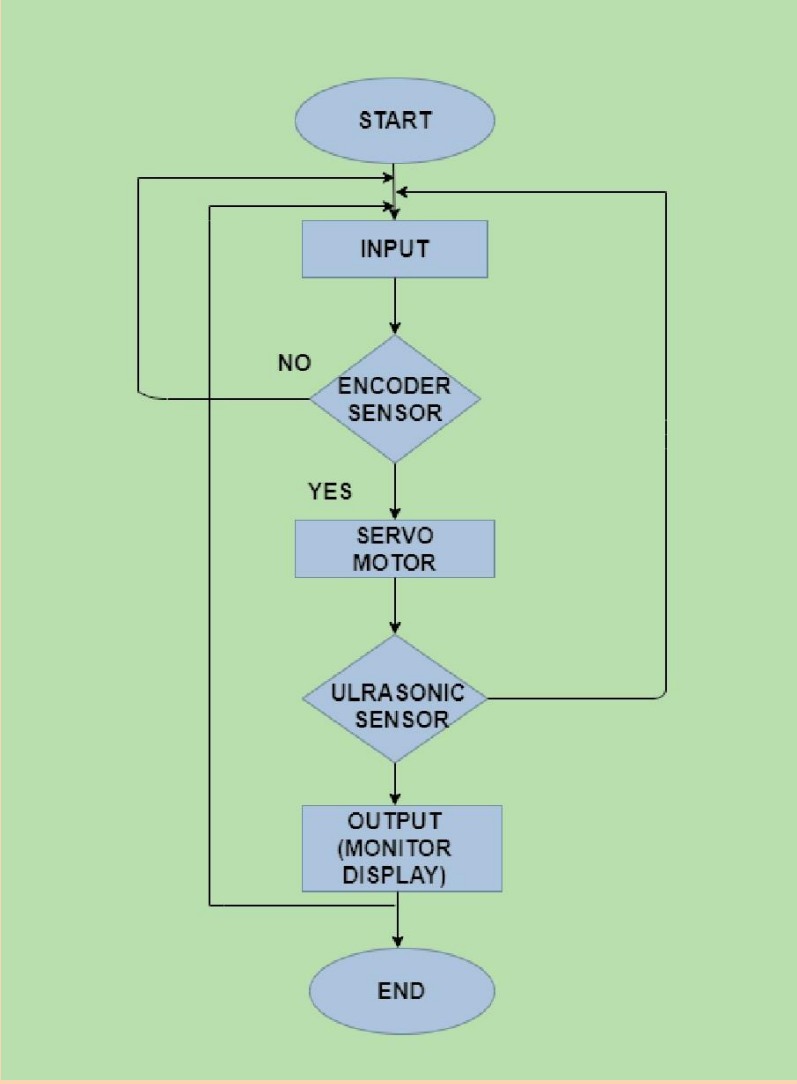


Fig-05FlowChartof RadarModel

Asweknowthatflowchartisusedtoknowor explain theprocessorbetterunderstand anything. So,In this flowchart we try to explain the process or entire process of our project.This help us to better understand means firstly we start that comes to its input process means which is given by the ultrasonic sensor to detect the objectand gives supply to our arduino, means gives input to the processing software. It detects the object by rotating with the help of a servomotor. Then next it comes to the output means to the monitor display it shows us the graphical representation of the output which also shows the distance and the range or angle of the object that is detected byour radar. So, this is the flow chart that helps us to better understand the process.

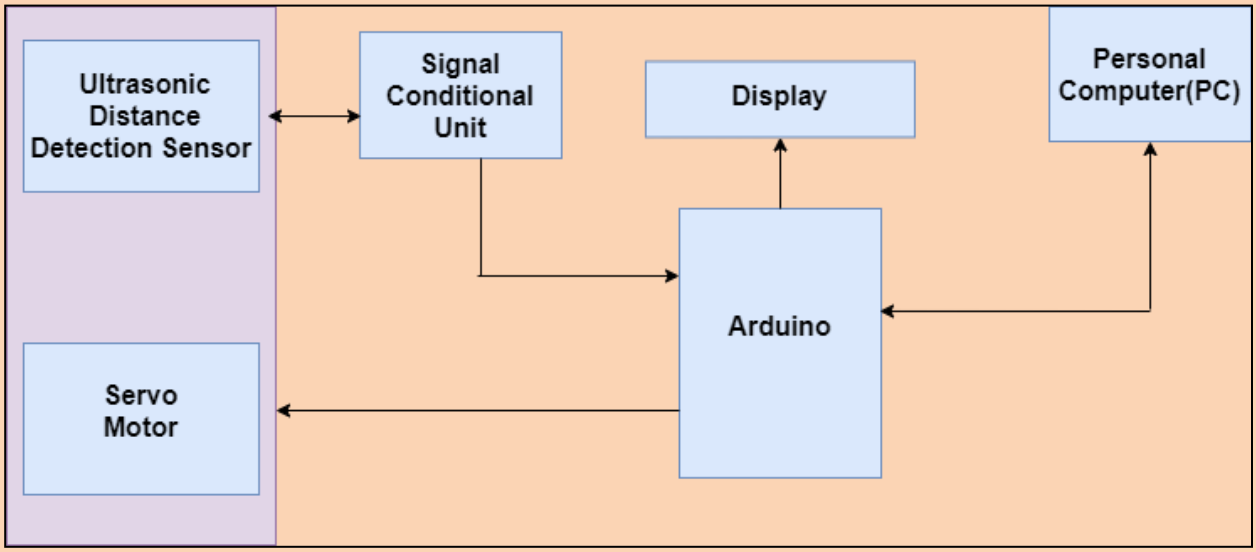


Fig-05Hardwaresystemdesignof radarsystem

Hardwaresystemdesign:

In this project we are basily using three hardwares or our projectmainly depends on three projects one is Arduino, Servo motor and Ultrasonic sensor. All these hardwares are most important and also other hardwares like jumper wire and breadboard e usedin this project. On the previous page we make the hardware system design that is easily understandable to each of us. So, in this diagram we have given everystep of hardware design that is used in our project.

Systemcircuitdesign:

In the previous figure we also explain the circuit design of our project in which we connect the digital pin ofthearduinowiththetriggerand the digital pin eight with theecho and the Vcc with the 3.3 volt pin and ground with the ground pin. Because in ultrasonic sensors there are four connections one is echo, trigger, Vcc and Ground. So in the previous page there is a circuit diagram or circuit design for our project.

CHAPTER4

LITERATURESURVEY

Ensuringtoencounterasegmentofthepapersasforutilizationusing,itwasdiscovered thought is looked through a great deal and is a standard thought ahead of time. The uses are not simply beneficial and strong yet notwithstanding a monetarily feasible Arduino based radar framework. Notjustthis,hereotherhelpfulutilizationsofultrasonicsensorswerenoticedaswell.This paper examines an observing framework whichis intended to quantify the speed of waves and the stature of a waterway through a ultrasonic sensor utilizing a microcontroller (Arduino). If the stream can't oblige the volume of water, at that point it will lower with land and this wonder is called flood or flood. We can conquer issues by prior ID in the tallness of water and noticing speed.Ontheoffchancethatwerecognizeissuespriorwecandefeatthisissuebeforeitturns into an emergency. Bytesting the framework forexamplestraightforwardwater level, itwas seen that super sonic has a precision of . Be that as it may, when it is executed in the streams there are numerous blunders due to various kinds of water levels because of hefty waves andspeedofwater and furthermore because of drifting of weighty articles. Dissimilar to Previous testing results, the creator coordinated this examination on the adjustment. The test was finished. The Arduino was utilized as a regulator of utilization. For more examination, data of profundity this framework will be shipped offthe information base worker site to be checked consistently.

A savvy driver observing and vehicle control framework is presented in this examination. This innovation is made to stay away from mishaps by observing the driver's exercises. The essayist expresses a portion of the fundamental purposes behind mishaps today. These are liquorutilization by the driver, heedlessness, sluggishness or clinical disease. The different structure, engines, transfers, attempts and are seen. Ultrasonic is used to caution the driver if any vehicle gravitatestowardhisvehicle.Itisseenbythehelpofsensorsexecutedinthevehicleandthe

inconspicuous components are revived to the owner. This framework conquers all the various viewpoints because of which different advancements intended for this reason have fizzled,making the framework more helpful, proficient and less expensive and less tedious. In this exploration paper creators have given data about the location of radio waves and following or going through a radar setwhich is worked from segments like an ultrasonic sensor,aservoengine and an Arduino. The creator examined the direct estimation issue due to which distance estimation was unrealistic between certain items, and was settled with the presentation of Ultrasonic distance measure. It permits us to take non contact estimations. This radar framework can radically lessen power utilization. The writer says that this framework is an This paper representsasystemforobstacledetectioninaknownenvironment.Thissystem works through an android based mobile camera. People who are Arduino based radar systems visually impaired, face difficulties in detecting obstacles and navigation while they walk. They use sticks for this problem nonetheless this manner or technique is not the right way of doing it. Object indicator or detector can overcome accidents or collision problems of people or the other way is theycan do

incredibly convenient radar framework, it can peruse or follow the distance and point of a hindrance and show it up on the screen. The ultrasonic was joined on top of the servo engine to recognize obstructions from option to left.

This paper speaks to a framework for snag location in a known climate. This framework works through an android based versatile camera. Individuals who are Arduino based radar frameworks outwardlyhindered, face troublesinrecognizingobstructions and routewhiletheywalk. They use sticks for this issue in any case this way or strategy isn't the correct method of doing it. Article pointer or finder can conquer mishaps or impact issues of individuals or the alternate wayis they can do exact guide perusing. The calculation which is made for indoor planning. In the indoor climate all unmistakable floors are taken in thought and a solitary picture is kept or put away for particular floors. These pictures of the floor are taken as reference pictures. The creator makes reference to that this calculation is precise and works continuously. There are various strategies examined in this paper for hindrance location. For these kinds of issues we can utilize the methodologyofSONARsensorandfurthermorelasercamera.Inthispaperpresentedafigurefor distinguishing prevention in known condition with an android based adaptable camera which sweeps a picked area before the camera for hindrance area.

CHAPTER5

CONCLUSION

Various progressed control strategies offered fashioners to have more order over various progressed applications. In our paper, the suggested planning strategy for the entire framework is surveyed on little standards. We have decided that our plan "Radar System" is an extremely tremendous field and the future extent of this innovation is high. We have colossal frameworks that have been executed or utilized . There is a top of future extent of this plan due to its security limit. It very well may be utilized in numerous applications. This system can likewise be created or altered by the rising requirements and requests . As we have planned a short reach radar consequently our exploration was determined and restricted. This framework can just identify objects from 0 to 180 degrees simply because the servoengine that we have utilizedcanpivotjusttothisreach.Alongtheselines,becauseofthisconstraintour plan can'tbeappliedtospots or zones for deterrent location for a bigger scope. Utilization of a 360 degrees pivoting servo engine can make the framework more productive. We anticipate changing this framework and upgrading our examination work by utilizing a completely 360 degrees pivoting servo and ahigher went ultrasonic sensor. We can additionally add highlights to this framework for example making it portable, mounting an alert framework to it which turns on when a deterrent is recognized. Further changes could be an impediment evading robots with reconnaissance frameworks.

DISCUSSION

InthispaperwehaveattemptedtouseultrasonicsensorsforimplementationofRADARandgota result that exceeds our presumed expectations. The basic systems created for preventing human effort. With some enhancements the system can be used for real time purpose

CHAPTER6

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APPENDIX

>>Mainhardware'susedinthisprojectareArduino,UltrasonicSensorandServoMotor.

>>ThisprojectisdonebytheArduinoIDEapplication.

>>ThisprojectisdonebytheProcessingIDEsoftware.


THANK
YOU