**Project report (Steering obstacle avoider)**

**Components used:**

1. **Arduino UNO**

This is an Atmega328P microcontroller based development board which is working as brain for the robot. It takes input from the different sensors and makes decisions accordingly and gives output to the motors and servo.

1. **IR Sensors**

These are simple Infrared led and photodiode sensors to detect the obstacle.

These work on basic principle that IR light emitted from the LED gets reflected from obstacle and gets received by the photo diode. A comparator compares the output of photo diode with the set threshold value and gives digital signal output when the comparison is positive.

1. **L293D Motor Driver**

This is H bridge based motor driver with 4 half bridges to control 2 motors with direction control. It has rating of 24V 1.2A maximum.

1. **HC SR-04 Ultrasonic sensor**

This is a sonar sensor having 2 ultrasonic wave emitters in which one emits the wave and another one receives it. The received signal then fed to controller to check the distance.

1. **12V 100RPM DC Geared Motors**

DC geared motors are used for driving rear wheels. They have maximum torque of 5Kg-cm.

1. **SG3003 Servo Motor**

The servo motor of 4.8Kg-cm max is used in front for steering control. It has maximum of 60 degree(30deg in left and 30 deg in right) angle control on steering.

1. **Chassis**

The external structure of the robot is made of 6mm transparent acrylic. It has dimension of 25cm x 25cm wheel to wheel.

1. **Power Supply**

The power supply to arduino and motors is given by 2 6V AA batteries saperately.

**Arduino code:**

#include <Servo.h>

#define echopin\_C 9 // echo pin

#define trigpin\_C 8 // Trigger pin

int maximumRange = 30;

int IR\_Left = 2;

int IR\_Right = 3;

int L, R;

long duration\_C,distance\_C;

Servo myservo;

void setup() {

myservo.attach(10);

myservo.write(33);//Initialization

delay(100);

// Serial.begin (9600);

pinMode (trigpin\_C, OUTPUT);

pinMode (echopin\_C, INPUT );

pinMode (IR\_Left, INPUT );

pinMode (IR\_Right, INPUT );

pinMode (4, OUTPUT);

pinMode (5, OUTPUT);

pinMode (6, OUTPUT);

pinMode (7, OUTPUT);

}

void loop ()

{

L=digitalRead(IR\_Left);

R=digitalRead(IR\_Right);

{

digitalWrite(trigpin\_C,LOW);

delayMicroseconds(2);

digitalWrite(trigpin\_C,HIGH);

delayMicroseconds(10);

duration\_C=pulseIn (echopin\_C,HIGH);

distance\_C= duration\_C/58.2;

// delay (50);

//Serial.println(distance\_C);

}

if ( distance\_C > 30)

{

myservo.write(33);

delay(100);

digitalWrite(4,HIGH);

digitalWrite(5,LOW);

digitalWrite(6,HIGH);

digitalWrite(7,LOW);

}

if ( R== HIGH)

{

myservo.write(3);

digitalWrite(4,HIGH);

digitalWrite(5,LOW);

digitalWrite(6,HIGH);

digitalWrite(7,LOW);

delay(1000);

}

if ( L== HIGH)

{

myservo.write(63);

digitalWrite(4,HIGH);

digitalWrite(5,LOW);

digitalWrite(6,HIGH);

digitalWrite(7,LOW);

delay(1000);

}

else if (distance\_C > 20 && distance\_C <= 30 )

{

myservo.write(63);

delay(100);

digitalWrite(4,HIGH);

digitalWrite(5,LOW);

digitalWrite(6,HIGH);

digitalWrite(7,LOW);

delay(1500);

}

else if ( distance\_C > 10 && distance\_C < 20 )

{

myservo.write(3);

delay(100);

digitalWrite(4,LOW);

digitalWrite(5,HIGH);

digitalWrite(6,LOW);

digitalWrite(7,HIGH);

delay(2000);

}

else if (distance\_C < 10)

{ digitalWrite(4,HIGH);

digitalWrite(5,HIGH);

digitalWrite(6,HIGH);

digitalWrite(7,HIGH);

delay(500);

}

}