**Code xe tự hành tránh vật cản:**

#include <Servo.h> //Servo motor library. This is standard library

#include <NewPing.h> //Ultrasonic sensor function library. You must install this library

//our L298N control pins

const int LeftMotorForward = 13; // banh ben trai tien

const int LeftMotorBackward = 12; // banh ben trai lui

const int RightMotorForward = 11; // banh ben phai tien

const int RightMotorBackward = 10; // banh ben phai lui

const int ena = 6;

const int enb = 5;

//sensor pins SR04

#define trig\_pin 7

#define echo\_pin 4

#define maximum\_distance 200

boolean goesForward = false;

int distance = 100;

NewPing sonar(trig\_pin, echo\_pin, maximum\_distance); //sensor function

Servo servo\_motor; //our servo name

void setup(){

Serial.begin(9600);

pinMode(RightMotorForward, OUTPUT);

pinMode(LeftMotorForward, OUTPUT);

pinMode(LeftMotorBackward, OUTPUT);

pinMode(RightMotorBackward, OUTPUT);

pinMode(ena, OUTPUT);

pinMode(enb, OUTPUT);

servo\_motor.attach(9); //our servo pin

servo\_motor.write(90);

delay(2000);

distance = readPing();

delay(100);

distance = readPing();

delay(100);

distance = readPing();

delay(100);

distance = readPing();

delay(100);

analogWrite(ena, 200); // chinh toc do dong co ben trai

analogWrite(enb, 200); // chinh toc do dong co ben trai

}

void loop(){

int distanceRight = 0;

int distanceLeft = 0;

delay(50);

if (distance <= 20){

moveStop(); // dung lai

delay(300);

moveBackward(); // lui ve sau

delay(400);

moveStop();// dung lai

delay(300);

distanceRight = lookRight(); // lay khoang cach ben trai

delay(300);

distanceLeft = lookLeft(); // lay khoang cach ben phai

delay(300);

if (distance >= distanceLeft){ // neu khoang cach toi da >= khoang cach ben trai

turnRight(); //re phai

moveStop();

}

else{ // ko thi

turnLeft(); // re trai

moveStop();

}

}

else{

moveForward(); // ko phai 2 truong hop tren thi chay thang

}

distance = readPing();

}

int lookRight(){ // nhin phai lay khoang cach

servo\_motor.write(10);

delay(500);

int distance = readPing();

delay(100);

servo\_motor.write(90);

return distance;

}

int lookLeft(){ // nhin trai lai khoang cach

servo\_motor.write(170);

delay(500);

int distance = readPing();

delay(100);

servo\_motor.write(90);

return distance;

delay(100);

}

int readPing(){

delay(70);

int cm = sonar.ping\_cm();

if (cm==0){

cm=250;

}

return cm;

}

void moveStop(){ // dung lai

digitalWrite(RightMotorForward, LOW);

digitalWrite(LeftMotorForward, LOW);

digitalWrite(RightMotorBackward, LOW);

digitalWrite(LeftMotorBackward, LOW);

}

void moveForward(){ // di thang

if(!goesForward){

goesForward=true;

digitalWrite(LeftMotorForward, HIGH);

digitalWrite(RightMotorForward, HIGH);

digitalWrite(LeftMotorBackward, LOW);

digitalWrite(RightMotorBackward, LOW);

}

}

void moveBackward(){

goesForward=false;

digitalWrite(LeftMotorBackward, HIGH);

digitalWrite(RightMotorBackward, HIGH);

digitalWrite(LeftMotorForward, LOW);

digitalWrite(RightMotorForward, LOW);

}

void turnRight(){

digitalWrite(LeftMotorForward, HIGH);

digitalWrite(RightMotorBackward, HIGH);

digitalWrite(LeftMotorBackward, LOW);

digitalWrite(RightMotorForward, LOW);

delay(300);

digitalWrite(LeftMotorForward, HIGH);

digitalWrite(RightMotorForward, HIGH);

digitalWrite(LeftMotorBackward, LOW);

digitalWrite(RightMotorBackward, LOW);

}

void turnLeft(){

digitalWrite(LeftMotorBackward, HIGH);

digitalWrite(RightMotorForward, HIGH);

digitalWrite(LeftMotorForward, LOW);

digitalWrite(RightMotorBackward, LOW);

delay(300);

digitalWrite(LeftMotorForward, HIGH);

digitalWrite(RightMotorForward, HIGH);

digitalWrite(LeftMotorBackward, LOW);

digitalWrite(RightMotorBackward, LOW);

}