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#include <AFMotor.h>
#include <NewPing.h>
#include <Servo.h>

#define TRIG_PIN A0
#define ECHO_PIN A1
#define MAX_DISTANCE 200
#define MAX_SPEED 190 // sets speed of DC motors
#define MAX_SPEED_OFFSET 20

NewPing sonar(TRIG_PIN, ECHO_PIN, MAX_DISTANCE);

AF_DCMotor motor1(1, MOTOR12_1KHZ);
AF_DCMotor motor2(2, MOTOR12_1KHZ);
AF_DCMotor motor3(3, MOTOR34_1KHZ);
AF_DCMotor motor4(4, MOTOR34_1KHZ);
Servo myservo;

boolean goesForward=false;
int distance = 100;
int speedSet = 0;

void setup() {

    myservo.attach(10);
    myservo.write(115);
    delay(2000);
    distance = readPing();
    delay(100);
    distance = readPing();
    delay(100);
    distance = readPing();
    delay(100);
    distance = readPing();
    delay(100);
}

void loop() {
    int distanceR = 0;
    int distanceL = 0;
    delay(40);

    if(distance<=15)
    {
        moveStop();
        delay(100);
        moveBackward();
        delay(300);
        moveStop();
        delay(200);
        distanceR = lookRight();
        delay(200);
        distanceL = lookLeft();
        delay(200);

        if(distanceR>=distanceL)
        {
            turnRight();
            moveStop();

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    }else
    {
        turnLeft();
        moveStop();
    }
}else
{
    moveForward();
}
distance = readPing();
}

int lookRight()
{
    myservo.write(50);
    delay(500);
    int distance = readPing();
    delay(100);
    myservo.write(115);
    return distance;
}

int lookLeft()
{
    myservo.write(170);
    delay(500);
    int distance = readPing();
    delay(100);
    myservo.write(115);
    return distance;
    delay(100);
}

int readPing() {
    delay(70);
    int cm = sonar.ping_cm();
    if(cm==0)
    {
        cm = 250;
    }
    return cm;
}

void moveStop() {
    motor1.run(RELEASE);
    motor2.run(RELEASE);
    motor3.run(RELEASE);
    motor4.run(RELEASE);
}

void moveForward() {

    if(!goesForward)
    {
        goesForward=true;
        motor1.run(FORWARD);
        motor2.run(FORWARD);
        motor3.run(FORWARD);
        motor4.run(FORWARD);
    }
}

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    for (speedSet = 0; speedSet < MAX_SPEED; speedSet +=2) // slowly bring the speed
up to avoid loading down the batteries too quickly
    {
        motor1.setSpeed(speedSet);
        motor2.setSpeed(speedSet);
        motor3.setSpeed(speedSet);
        motor4.setSpeed(speedSet);
        delay(5);
    }
}

void moveBackward() {
    goesForward=false;
    motor1.run(BACKWARD);
    motor2.run(BACKWARD);
    motor3.run(BACKWARD);
    motor4.run(BACKWARD);
    for (speedSet = 0; speedSet < MAX_SPEED; speedSet +=2) // slowly bring the speed
up to avoid loading down the batteries too quickly
    {
        motor1.setSpeed(speedSet);
        motor2.setSpeed(speedSet);
        motor3.setSpeed(speedSet);
        motor4.setSpeed(speedSet);
        delay(5);
    }
}

void turnRight() {
    motor1.run(FORWARD);
    motor2.run(FORWARD);
    motor3.run(BACKWARD);
    motor4.run(BACKWARD);
    delay(500);
    motor1.run(FORWARD);
    motor2.run(FORWARD);
    motor3.run(FORWARD);
    motor4.run(FORWARD);
}

void turnLeft() {
    motor1.run(BACKWARD);
    motor2.run(BACKWARD);
    motor3.run(FORWARD);
    motor4.run(FORWARD);
    delay(500);
    motor1.run(FORWARD);
    motor2.run(FORWARD);
    motor3.run(FORWARD);
    motor4.run(FORWARD);
}

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