

/*obstacle avoiding, Bluetooth control, voice control robot car.

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*/

#include <Servo.h>

#include <AFMotor.h>

#define Echo A0

#define Trig A1

#define motor 10

#define Speed 170

#define spoint 103

char value;

int distance;

int Left;

int Right;

int L = 0;

int R = 0;

int L1 = 0;

int R1 = 0;

Servo servo;

AF_DCMotor M1(1);

AF_DCMotor M2(2);

AF_DCMotor M3(3);

AF_DCMotor M4(4);

void setup() {

Serial.begin(9600);

pinMode(Trig, OUTPUT);

pinMode(Echo, INPUT);

servo.attach(motor);

```

M1.setSpeed(Speed);
M2.setSpeed(Speed);
M3.setSpeed(Speed);
M4.setSpeed(Speed);
}
void loop() {
    //Obstacle();
    //Bluetoothcontrol();
    //voicecontrol();
}
void Bluetoothcontrol() {
    if (Serial.available() > 0) {
        value = Serial.read();
        Serial.println(value);
    }
    if (value == 'F') {
        forward();
    } else if (value == 'B') {
        backward();
    } else if (value == 'L') {
        left();
    } else if (value == 'R') {
        right();
    } else if (value == 'S') {
        Stop();
    }
}
void Obstacle() {

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distance = ultrasonic();
if (distance <= 12) {
    Stop();
    backward();
    delay(100);
    Stop();
    L = leftsee();
    servo.write(spoint);
    delay(800);
    R = rightsee();
    servo.write(spoint);
    if (L < R) {
        right();
        delay(500);
        Stop();
        delay(200);
    } else if (L > R) {
        left();
        delay(500);
        Stop();
        delay(200);
    }
} else {
    forward();
}
}

void voicecontrol() {
    if (Serial.available() > 0) {

```

```
value = Serial.read();  
Serial.println(value);  
if (value == '^') {  
    forward();  
} else if (value == '-') {  
    backward();  
} else if (value == '<') {  
    L = leftsee();  
    servo.write(spoint);  
    if (L >= 10 ) {  
        left();  
        delay(500);  
        Stop();  
    } else if (L < 10) {  
        Stop();  
    }  
} else if (value == '>') {  
    R = rightsee();  
    servo.write(spoint);  
    if (R >= 10 ) {  
        right();  
        delay(500);  
        Stop();  
    } else if (R < 10) {  
        Stop();  
    }  
} else if (value == '*') {  
    Stop();  
}
```

```

    }
}
}
// Ultrasonic sensor distance reading function
int ultrasonic() {
    digitalWrite(Trig, LOW);
    delayMicroseconds(4);
    digitalWrite(Trig, HIGH);
    delayMicroseconds(10);
    digitalWrite(Trig, LOW);
    long t = pulseIn(Echo, HIGH);
    long cm = t / 29 / 2; //time convert distance
    return cm;
}

void forward() {
    M1.run(FORWARD);
    M2.run(FORWARD);
    M3.run(FORWARD);
    M4.run(FORWARD);
}

void backward() {
    M1.run(BACKWARD);
    M2.run(BACKWARD);
    M3.run(BACKWARD);
    M4.run(BACKWARD);
}

void right() {
    M1.run(BACKWARD);

```

```
M2.run(BACKWARD);  
M3.run(FORWARD);  
M4.run(FORWARD);  
}  
void left() {  
    M1.run(FORWARD);  
    M2.run(FORWARD);  
    M3.run(BACKWARD);  
    M4.run(BACKWARD);  
}  
void Stop() {  
    M1.run(RELEASE);  
    M2.run(RELEASE);  
    M3.run(RELEASE);  
    M4.run(RELEASE);  
}  
int rightsee() {  
    servo.write(20);  
    delay(800);  
    Left = ultrasonic();  
    return Left;  
}  
int leftsee() {  
    servo.write(180);  
    delay(800);  
    Right = ultrasonic();  
    return Right;  
}
```