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//www.fb.com/arafa.microsys
int BUZ = 8;    // BUZ connected to digital pin 8
#include <Servo.h>
#define in1 2   //Right motor pole 1
#define in2 3   //Right motor pole 2
#define in3 4   //left motor pole 1
#define in4 7   //left motor pole 1
#define ena 5   //Right motor speed
#define enb 6   //Right motor speed
Servo myservo;  // create servo object to control a servo
int pos = 0;    // variable to store the servo position
const int trigPin = 11; //Trigger Pin of Ultrasonic
const int echoPin = 12; //Echo Pin of Ultrasonic
long duration; //used by ultrasonic Function
int distance, Cdistance, Rdistance, Ldistance; //Cdistance=center Distance
Rdistance=Right Distance Ldistance=Left Distance
unsigned long z = 0;
void setup()
{
    pinMode(LED, OUTPUT);    // sets the digital pin as output
    pinMode(BUZ, OUTPUT);    // sets the digital pin as output
    pinMode(in1, OUTPUT);
    pinMode(in2, OUTPUT);
    pinMode(in3, OUTPUT);
    pinMode(in4, OUTPUT);
    pinMode(ena, OUTPUT);
    pinMode(enb, OUTPUT);
    pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
    pinMode(echoPin, INPUT);  // Sets the echoPin as an Input
    myservo.attach(9); // attaches the servo on pin 9 to the servo
object
    myservo.write(85); // Initial Pos of Servo at center
}

void loop()
{
    while (z < 100 ){
        Cdistance=ultrasonic(); //take ultrasonic distance value
        if(Cdistance>30) //if greater than 30 Cm
        {
            forward(); //go to forward
        }else
        {
            if(Cdistance<=10&&Cdistance>2) reverse(); // if close to object
reverse to get more space to change orientation
            off(); //stop robot
        }
    }
}

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    myservo.write(35);          //Turn servo Right
    delay(300);
    Rdistance=ultrasonic(); //get ultrasonic value at right
    myservo.write(135);        // Turn servo Left
    delay(300);
    Ldistance=ultrasonic(); //get ultrasonic value at left
    myservo.write(85);          //return to center pos
    delay(300);
    comparison(Rdistance, Ldistance); //go to Comparasion function
    off();                      // stop after execute Comparison function
}
action
{
    delay(150);
}
// reset all variables
Rdistance=0;
Ldistance=0;
Cdistance=0;
}
off();

}

int ultrasonic(void)//get distance captured by ultrasonic sensor
{
    distance=0;
    // Clears the trigPin
    digitalWrite(trigPin, LOW);
    delayMicroseconds(2);
    // Sets the trigPin on HIGH state for 10 micro seconds
    digitalWrite(trigPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigPin, LOW);
    // Reads the echoPin, returns the sound wave travel time in
    microseconds
    duration = pulseIn(echoPin, HIGH);
    // Calculating the distance
    distance= duration*0.034/2;
    return distance;
}

void comparison(int r, int l)//compare values of right and left Servo
Pos
{
    if(r>25||l>25)
    {
        if(r>1||r==1)
        {
            Tright90();
        }
    }
}

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    }else if(l>r)
    {
        Tleft90();
    }
}else if(r<25&&l<25)
{
    Tleft180();
}
}
void forward()
{
    digitalWrite(LED, HIGH);           // sets the LED on
    digitalWrite(BUZ, HIGH);           // sets the BUZ on
    delay(1000);                        // waits for a second
    digitalWrite(LED, LOW);            // sets the LED off
    digitalWrite(BUZ, LOW);            // sets the BUZ off
    delay(1000);                        // waits for a second

    analogWrite(ena,130);
    analogWrite(enb,130);
    digitalWrite(in1,LOW);
    digitalWrite(in2,HIGH);
    digitalWrite(in3,LOW);
    digitalWrite(in4,HIGH);
}
void off()
{
    digitalWrite(in1,LOW);
    digitalWrite(in2,LOW);
    digitalWrite(in3,LOW);
    digitalWrite(in4,LOW);
}
void Tleft90()
{
    analogWrite(ena,160);
    analogWrite(enb,150);
    digitalWrite(in1,LOW);
    digitalWrite(in2,HIGH);
    digitalWrite(in3,HIGH);
    digitalWrite(in4,LOW);
    delay(650);
}
void Tright90()
{
    analogWrite(ena,150);
    analogWrite(enb,160);
    digitalWrite(in1,HIGH);
    digitalWrite(in2,LOW);

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    digitalWrite(in3,LOW);
    digitalWrite(in4,HIGH);
    delay(750);
}

void Tleft180()
{
    analogWrite(ena,150);
    analogWrite(enb,150);
    digitalWrite(in1,LOW);
    digitalWrite(in2,HIGH);
    digitalWrite(in3,HIGH);
    digitalWrite(in4,LOW);
    delay(1500);
}
void reverse()
{
    analogWrite(ena,140);
    analogWrite(enb,140);
    digitalWrite(in1,HIGH);
    digitalWrite(in2,LOW);
    digitalWrite(in3,HIGH);
    digitalWrite(in4,LOW);
    delay(450);
}
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