Chittagong University of Engineering & Technology

Department of Electrical & Electronic Engineering

Course No : EEE-242
Course Title: Electrical Shop Practice

Project Title:

Robotic Arm Control with using Servo Motor

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REMARKS:

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Objective:

The objective of the project is to design a robotic arm and control it with servo motors.

Introduction:

Robotic arms are designed in such a way that they are able to perform a wide variety of tasks like moving from one point to another at different speeds, picking objects from any random point and place it to any other point. It is controlled by Arduino-UNO microcontroller which accepts input signal from user by means of a set of potentiometer. Here we have used servo motors. A Servo motor can pick 9 gram of weight. Servo motors can rotate up to 180 degree and one of the main advantage of servo motor is that it can lock when we command it.
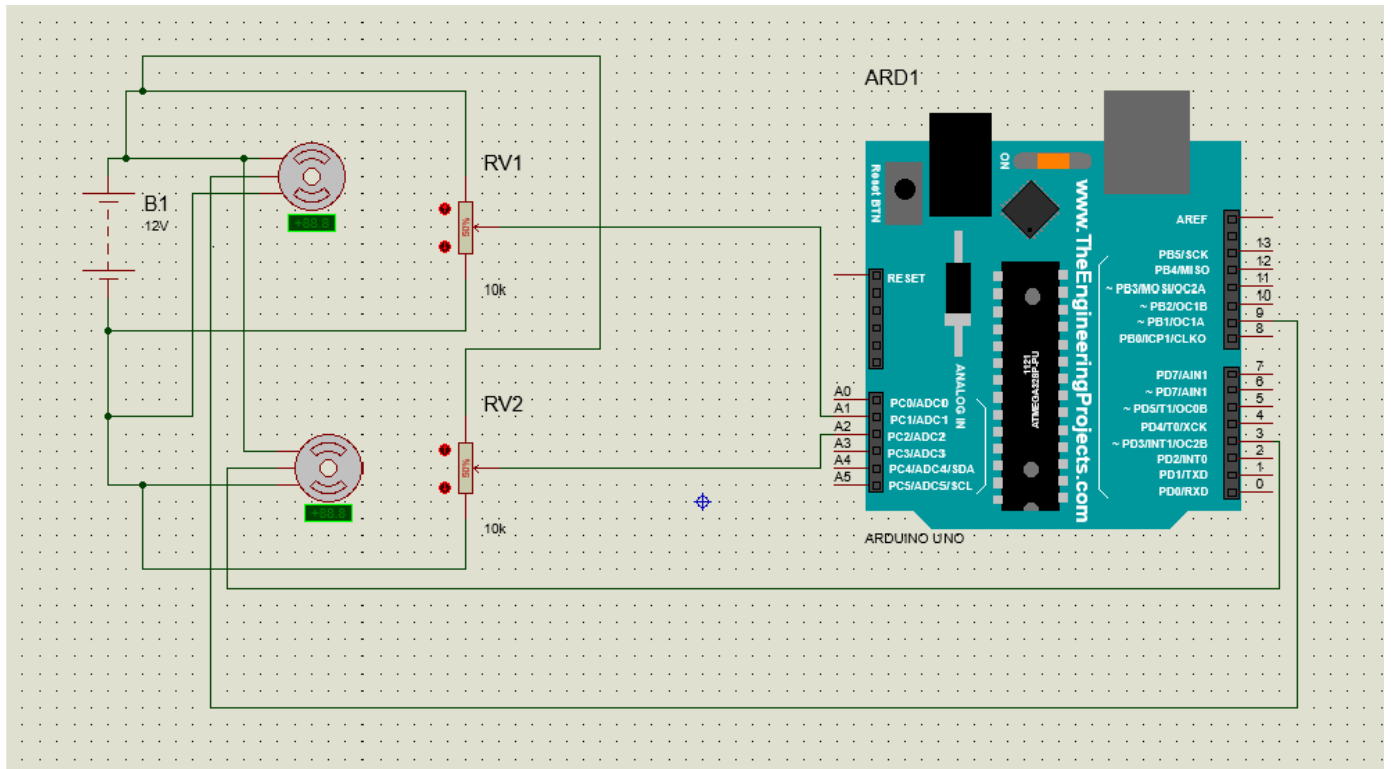
Component list:

1. Servo motors

2. Potentiometers

3. 12V battery

4. Breadboard

5. ARDUINO UNO

6. Connecting Wures

7. Plastic wood

Cost estimation:

Component name	Number of component	price
Servo motors	2	800
Breadboard	1	90
Plastic wood	1	130
ARDUINO UNO	1	380
Potentiometer	2	50
12V battery	1	1500

Setup:

Steps of Project Construction :

1) Firstly, we wrote a code in Arduino software. Then we compiled it and uploaded the code in our Arduino.

2) Then, we have connected the potentiometers with Arduino analog pin. Among three pins of each pot, the first one is connected with the supply point of breadboard, the last pin is connected with the ground point of breadboard and the middle pin of each pot are connected with the analog pin A1 & A2 respectively.

3) Then, both servo motor's Supply pin is connected with the supply point and the ground pin is connected to the ground point. The signal pin of one servo motor is connected with the PWM pin-3 of Arduino and the other one's signal pin is connected with the PWM pin-9.

4) Then we have connected positive supply point Lippo battery in the supply point and negative with the ground.

5) Then the servo motor started to rotate. By regulating the potentiometers, we can control the servo motor's rotation.

Arduino Code:

```
#include <Servo.h>

Servo servo1;

Servo servo2;


int pot1=A1;

int pot2=A2;


int valpot1;

int valpot2;

void setup()

{

servo1.attach(3);

servo2.attach(9);

}

void loop()

{

valpot1 = analogRead(pot1);

valpot1=map(valpot1, 0 ,1023, 0, 180);

servo1.write(valpot1);

delay(15);

valpot2 = analogRead(pot2);

valpot2= map(valpot2, 0 ,1023, 0, 180);

servo2.write(valpot2);

delay(15);

}
```

Applications:

Robotic arm can be used in industries for assembly, process automation, PCB manufacturing. These may include servicing nuclear power station, welding & repairing pipe lines on the ocean flow, remote servicing of utility power lines or cleaning up radioactive and other hazardous wastes.

Conclusion :

In the project, we have controlled a robotic arm with servo motor using Arduino. Here, we were about to use Bluetooth module for controlling the arm. But because of connection problem of Bluetooth module. So we have used potentiometer for controlling the arm. But here we have faced many problems to control the arm. Here when we connected the Arduino supply pin Vin and ground with the 12 V supply, one of the wire and Arduino caught fired. Thus, we have changed our Arduino, servo motor and the wires also. Now we gave supply at Arduino from our PC.

GITHUB link :

https://github.com/moni99/RoboArmControl/tree/master