



## **CSE461 LAB REPORT 03**

### **Introducing servo motor using along with push buttons and LEDs with Raspberry Pi**

#### **GROUP 06**

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## **Objective:**

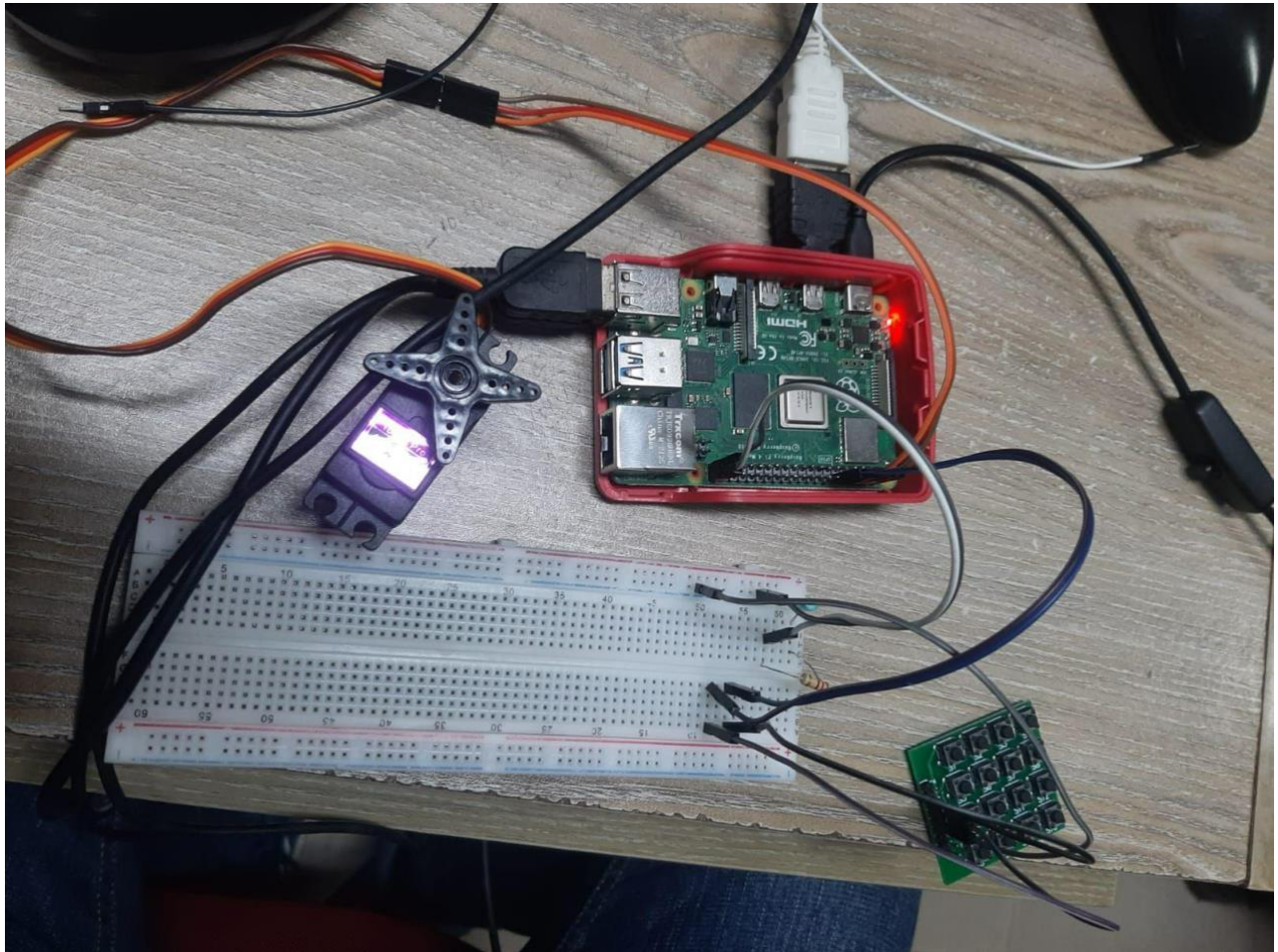
This Lab is designed to provide the basic idea to control a DC motor using the Servo Motor(SG-90). By moving the sensor in an upward or downward direction, the direction of the motors will be changed. How to control a DC motor using a Motor driver.

## **Required Equipment:**

- Raspberry Pi
- Breadboard
- Servo Motor (SG-90)
- Jumper Wire
- Resistor
- Green LED
- MicroSD Card
- Monitor, Keyboard, Mouse

## Experimental Setup

Picture of the Components:



**Explanation:** We used raspberry pi , motor driver , Servo motor, buttons connected together in a case and we connected the red wire of motor to the VCC of raspberry pie and the yellow wire is connected to GPIO 14 then we connected the green LED and button into breadboard and then into the raspberry pie. Finally we uploaded the code.

### **Code:**

```
from gpiozero.pins.pigpio import PiGPIOFactory
from gpiozero import Device, Servo, AngularServo
from time import sleep
Device.pin_factory = PiGPIOFactory()
s = AngularServo(14,min_angle = 0, max_angle =
180,min_pulse_width=0.5/1000,max_pulse_width = 25/10000)
led = LED(21)
button = Button(15)
button = Button(18)
```

### **while True:**

```
    button1.wait_for_press()
    s.angle=120# (120 degree to the left)
    sleep(1)
    #right
    s.angle=60 # 60 degree to the right
    sleep(1)
```

### **Results:**

After the experiment is finished, we will be able to use a Raspberry Pi and a motor driver to control the way that a DC motor rotates. The position of the motor's rotation can be changed by adjusting the state of the GPIO pins that are attached to the motor driver. Using a Raspberry Pi and a motor driver, this setup is a flexible and adaptable method to manage the rotation of a DC motor, with the ability to change the speed and direction of the motor rotation through software.

**Discussions:**

In conclusion, the system used to regulate a DC motor's rotation using a motor driver and a Raspberry Pi is a cheap and adaptable option for a variety of uses. Instead of connecting the motor directly to the Raspberry Pi, you can operate it more easily and securely by using a motor driver. Greater control and automation are made possible by the Raspberry Pi, which offers a simple method to easily control the direction and speed of the motor through software. The configuration also makes it simple to integrate additional sensors and gadgets, like limit switches or encoders, to improve the motor's control and input. Moreover, The Python programming language and libraries like RPi.GPIO also make it simpler to create and change the motor control code. With the ability to change the direction and speed of the motor using software, the system for controlling the rotation of a DC motor using a motor driver and a Raspberry Pi offers an adaptable and individualized solution for motor control. When building up this system, it's crucial to make the right component choices and take the appropriate safety measure

