



SEMESTER: SUMMER 2023

INTRODUCTION TO ROBOTICS

CSE-461

LAB REPORT - 05

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Experiment Number: 05

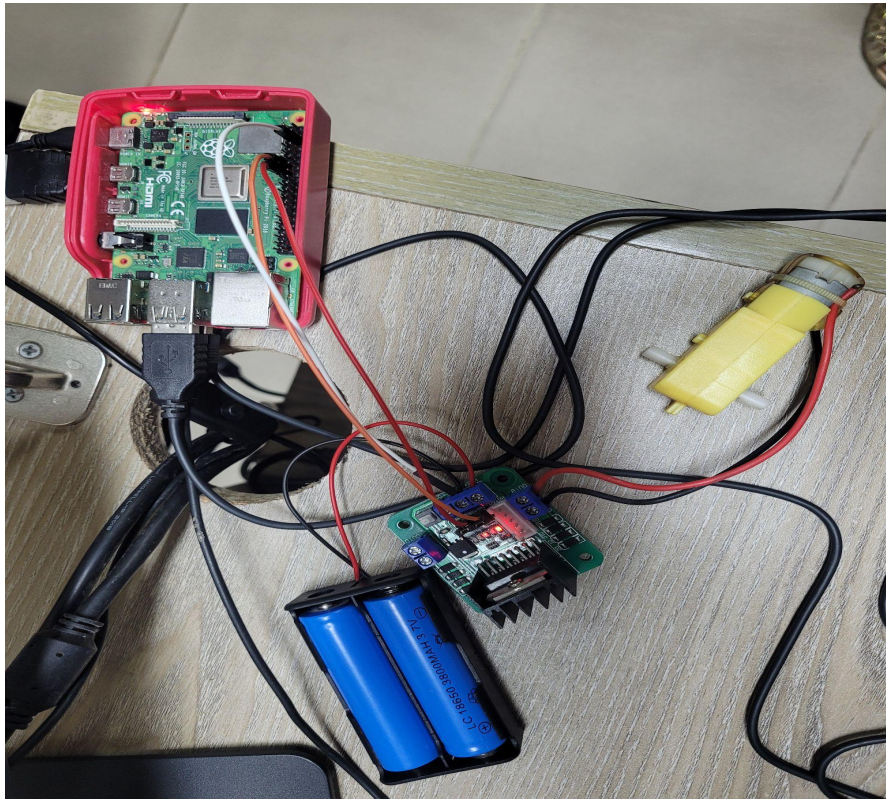
Name of the Experiment: Controlling of DC Motors using Motor Driver L298N.

Objective: The experiment's objective is to demonstrate the control of DC motors using the L298N motor driver. Through this experiment, we will learn about interfacing hardware components, understanding motor control mechanisms, and utilizing the capabilities of the L298N driver. This hands-on experience aims to enhance knowledge of motor control, driver integration, and practical applications of electronic components in real-world systems.

Equipments: For controlling the DC Motors on the Raspberry Pi 4, we need the following electronic components for controlling the DC Motors on the Raspberry Pi 4:

- Raspberry Pi
- DC Motor (1 piece)
- Motor Driver L298N
- Battery 3.7V (2 pieces)
- Battery Case (1)
- Jumper Wire
- Breadboard

Experimental Setup:



Code:

DC Motor code:

```
import RPi.GPIO as GPIO
```

```
from time import sleep
```

```
in1 = 27
```

```
in2 = 22
```

```
GPIO.setmode(GPIO.BCM)
```

```
GPIO.setup(in1,GPIO.OUT)
```

```
GPIO.setup(in2,GPIO.OUT)
```

```
GPIO.output(in1,GPIO.LOW)
```

```
GPIO.output(in2,GPIO.LOW)
```

```
while(True):
```

```
    GPIO.output(in1,GPIO.LOW)
```

```
    GPIO.output(in2,GPIO.HIGH)
```

```
    sleep(3)
```

```
    GPIO.output(in1,GPIO.HIGH)
```

```
    GPIO.output(in2,GPIO.LOW)
```

```
    sleep(3)
```

Result: The results of the experiment showed successful control of DC motors using the L298N motor driver. The motors responded effectively to the input commands, showcasing reliable speed and direction adjustments. This demonstrated the functionality and efficiency of the motor driver in regulating motor operations. The experiment also reinforced participants' understanding of motor control principles and driver implementation. Additionally, challenges related to power supply and signal connections were identified, highlighting the importance of proper wiring and electrical considerations. Overall, the experiment yielded valuable insights into motor driver utilization and practical considerations for motor control setups.

Discussion: The discussion highlights the successful implementation of DC motor control via the L298N motor driver, showcasing its significance in practical applications such as robotics. However, challenges related to stable power supply and precise signal connections emerged,

impacting motor performance and control accuracy. This experience enriched participants' understanding of motor drivers' role in achieving accurate control, relevant across industries. Addressing real-world power and connectivity issues during the experiment equipped participants with valuable troubleshooting skills. Overall, the experiment served as a foundational step, enabling participants to apply their enhanced motor control expertise effectively in diverse scenarios.