EXPERIMENT 4: MANUAL SPEED CONTROL

Objective

This experiment's objective is to implement manual speed control for the Chelonia Bot using a potentiometer and a push button. By turning the potentiometer, users can adjust the speed of the robot's movement forward. Additionally, a push button is utilized to stop the robot when released.

Setup

Before running the experiment, ensure that you have assembled the Chelonia Bot hardware as per the assembly instructions in Section 2.1. Additionally, make sure you have connected the Chelonia Bot to the Arduino IDE, as explained in Section 2.3.

Hardware Setup:
- **Motor Connections:**
  - Motor A (Left Motor):
    - Enable (ENA): Connect to pin 9 (PWM)
    - Input 1 (IN1): Connect to pin 8
    - Input 2 (IN2): Connect to pin 7
  - Motor B (Right Motor):
    - Enable (ENB): Connect to pin 3 (PWM)
    - Input 1 (IN3): Connect to pin 5
    - Input 2 (IN4): Connect to pin 4
- **Potentiometer:**
  - Connect the potentiometer to pin A0 (Analog 0).

In case you encounter any uncertainties during the hardware setup, we recommend the following link: Potentiometer arduino connection.
- **Push Button:**
  - Connect the push button to pin 2.We recommended the following link Pushbutton Arduino connection.

Code Example: Manual speed control using potentiometer

Usage Instructions
- Turn the potentiometer to adjust the speed of the Chelonia Bot.
- Press and hold the push button to make the robot move forward.
- Release the push button to stop the robot.

Expected Results

The Chelonia should respond to the adjusted potentiometer value, resulting in varied speeds as the push button is pressed.

Frequently Asked Questions (FAQs)

Q: Can I modify the code for different motor behaviors?

A: Yes, you can customize the code to implement various motor behaviors by adjusting the logic in the **moveForward**() and **stopMotors**() functions.

Q: How does the potentiometer affect the robot's speed?

A: Turning the potentiometer adjusts the analog input, mapped to PWM values, thereby controlling the speed of both motors.