

# ECE 476/676 - Homework #4

*Timing, Analog I/O, Motors with Binary Inputs - Due Monday, February 10th*

## Motor Speed Control

1) Hardware: Connect your DC motor to your Pi-Pico. Verify that the Pico can make the motor spin CW and CCW

2) Software: Write a Python program which

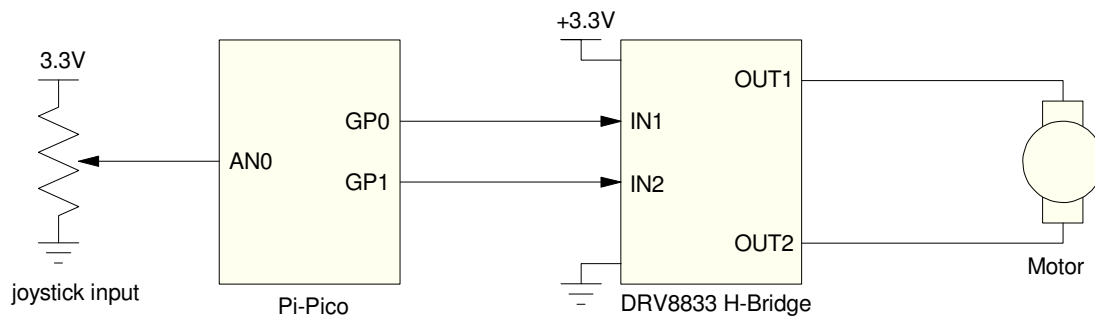
- Reads the analog input on AN0 (the joystick input) and
- Drives a DC motor via an H-bridge

The analog input controls the PWM driving the motor

- When the joystick is left in it's rest state (middle position), the PWM to the motor remains constant
- When the joystick is pushed forward (towards 3.3V), the motor speeds up (PWM slowly increases to +100%)
- When the joystick is pulled back (towards 0V), the motor slows down (PWM slowly decreases to -100%)

3) Test and verify your Python program works

4) Demo (in-person or with a video)



## Motor Angle Control

5) Hardware: Connect your digital servo motor to your Pi-Pico.

6) Software: Write a Python program which

- Reads the analog input on AN0 (the joystick input) and
- Drives a digital servo motor

The analog input controls the position of the motor using a pulse width

- When the joystick is left in it's rest state (middle position), the motor position remains constant (pulse width is constant)
- When the joystick is pushed forward (towards 3.3V), the motor turns CW (pulse width increases to 2.5ms)
- When the joystick is pulled back (towards 0V), the motor turns CCW (pulse width slowly decreases to 0.5ms)

7) Test and verify your Python program works

8) Demo (in-person or with a video)

