Motor control with MATLAB

On Arduino Uno

Hardware & Software:

• Arduino Uno
• Micro servo motor
• Arduino USB & Jumper cables
• MATLAB student suite.
Getting started with Arduino Uno and MATLAB

Step 1  Install the MATLAB and simulink arduino support packages from MATLAB add-on installers
Step 2 Log in to Mathworks account and “accept” the license agreement.

Step 3 Install all the support packages required. After successful installation, MATLAB will prompt user to install the USB drivers for Arduino. Proceed to install these as well. Once done, user can start using the Arduino board with MATLAB.
Step 4
Connect the Arduino board to the development machine and check for the assigned COM port under Device Manager (Windows OS machines).

Step 5
Connect the servo motor to the board with the 5V line (red) connected to the 5V supply on the board, GND (black) to GND on the board and the motor control line connected to Digital pin 4 (PWM) of the board.

Step 6
In the MATLAB command window, create an arduino object & a servo object assigned to pin D4 (Digital Out, PWM) of the arduino board.

```
a = arduino('com31', 'uno', 'Libraries', 'Servo');
s = servo(a, 'D4');
```

The “Servo” library from the support package is used here. There are other libraries that can also be used with the motor control shield. As soon as the servo object is created, the motor spins once.
Create a new script and type the following code. This will spin the motor from 0-180 degrees once in steps of 18 degrees. Please refer to the datasheet of the motor to calculate steps and angles.

Un-comment the “flag” and the “while” loop lines to make an infinite loop.

To quit the infinite loop, press Ctrl + C on the command window.

clearvars

a = arduino('com31', 'uno', 'Libraries', 'Servo');
s = servo(a, 'D4');

%flag = 1;

%while flag
    for angle = 0:0.1:1
        writePosition(s, angle);
        current_pos = readPosition(s);
        current_pos = current_pos*180;
        fprintf('Current motor position is %d degrees
', current_pos);
        pause(1);
    end
%end
Final Result: