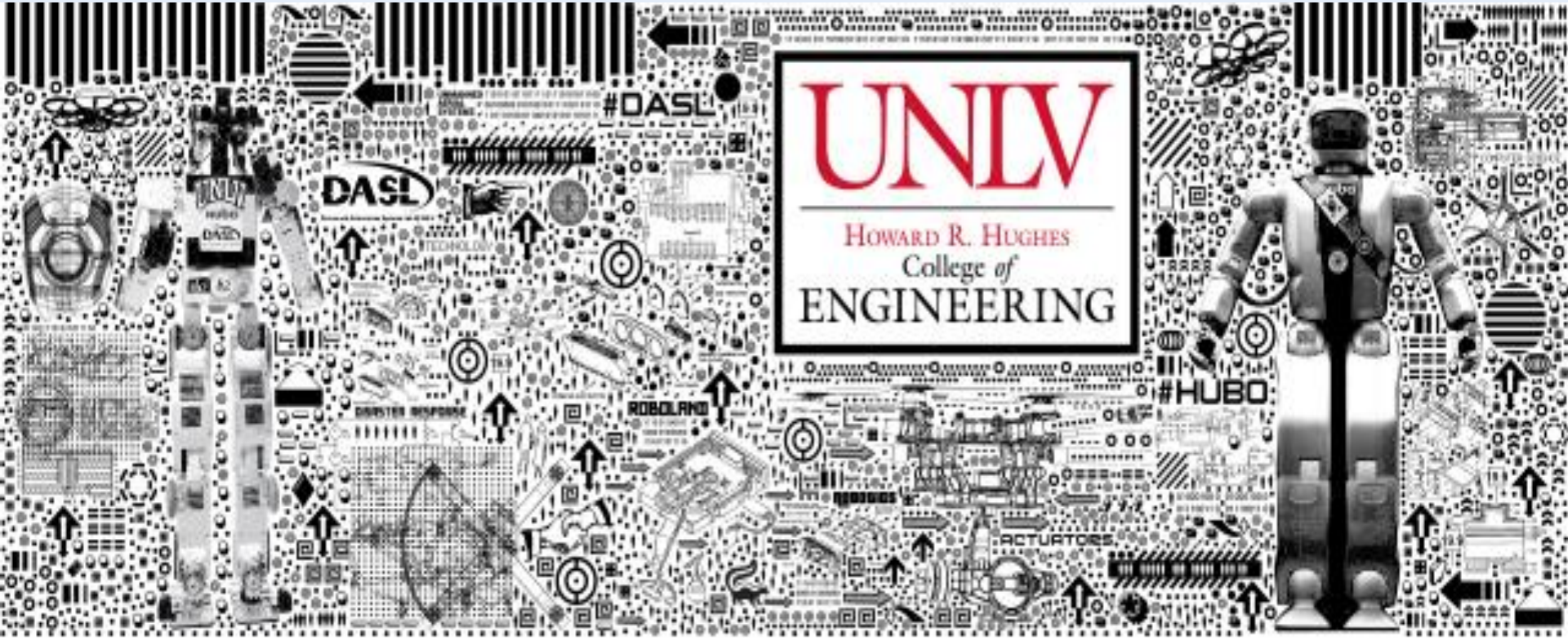
UNIVERSITY OF NEVADA LAS VEGAS
DRONES AND AUTONOMOUS SYSTEMS LAB (DASL@UNLV)



DARWIN-OP INTRODUCTION [DASL-104]

WEEK 2

INSTRUCTOR: JEAN CHAGAS VAZ

Tuesday, April 11, 2017, 09:41

- **Dynamixel;**
  - Overview;
- **Robo-Plus;**
  - Robo-Plus characteristic;
  - Dynamixel Wizard walkthrough;
- **Dynamixel's Calibration;**
  - PID controller;
  - Hands-On;
- **DARwIn-OP & Ubuntu;**
  - Walkthrough;
- **Monitoring Dynamixels through DARwIn-OP;**
  - Walkthrough;

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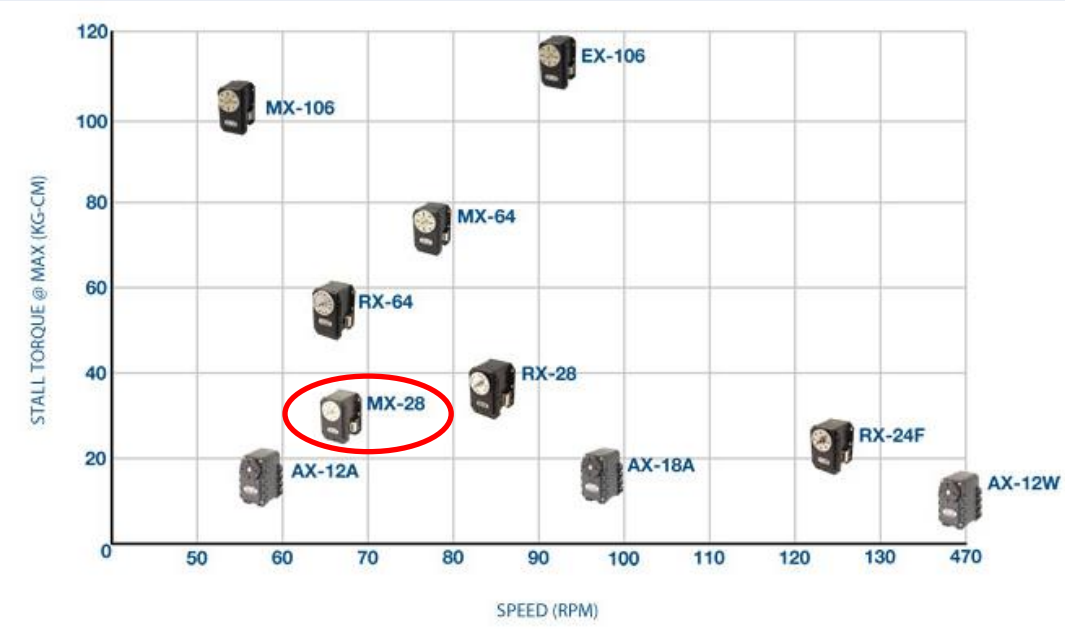
➢ Dynamixel;

- **Overview;**



Source: http://support.robotis.com

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➢ Dynamixel;

- Overview;
  - Specifications;

MX-28 Stats			
Operating Voltage	14.8V	12V	11.1V
Stall Torque*	31.6 kg·cm 439 oz·in 3.1 N.m	25.5 kg·cm 354 oz·in 2.5 N.m	23.4 kg·cm 325 oz·in 2.3 N.m
No-load Speed	67 RPM	55 RPM	50 RPM
Weight	72g		
Size	35.6 x 50.6 x 35.5 mm		
Resolution	0.088°		
Reduction Ratio	193 : 1		
Operating Angle	0° ~ 360° or Continuous Turn		
Max Current	1.4A @ 12V		
Standby Current	100 mA		
Operating Temp	-5°C ~ 80°+C		
Protocol	TTL Asynchronous Serial		
Module Limit	254 valid addresses		
Com Speed	8000bps ~ 3Mbps		
Position Feedback	Yes		
Temp Feedback	Yes		
Load Voltage Feedback	Yes		
Input Voltage Feedback	Yes		
Compliance/PID	Yes		
Material	Metal Gears & Engineering Plastic Body		

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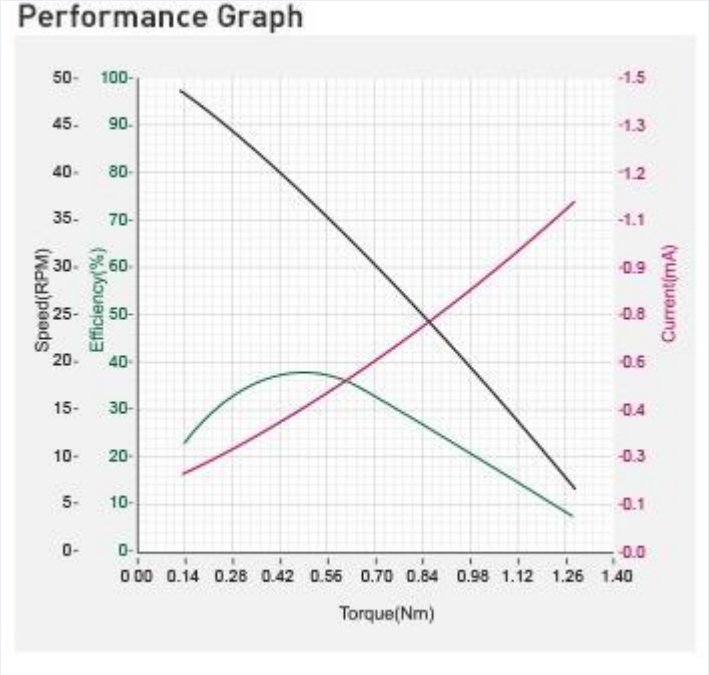
- **Dynamixel;**
  - **Overview;**
    - **Performance Graph;**



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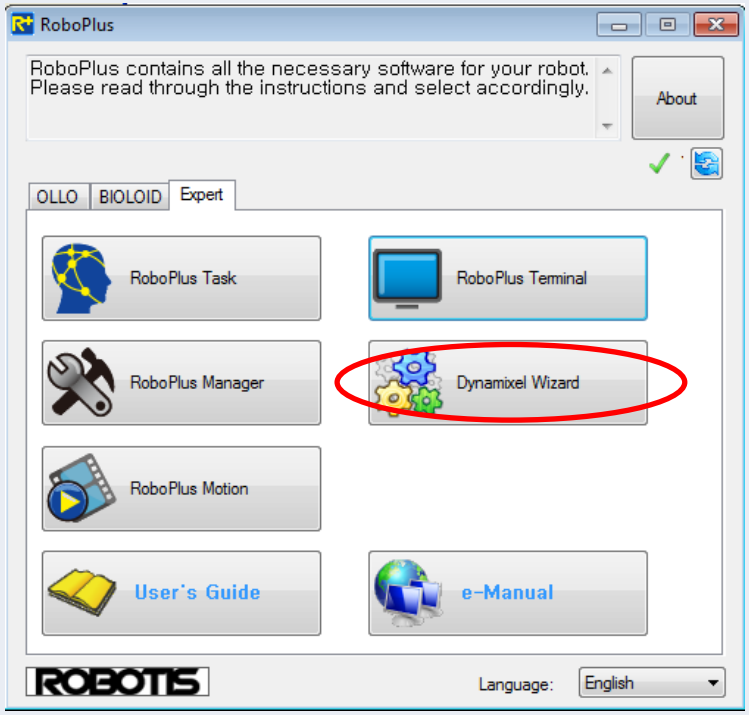
➢ Robo-Plus;

- Robo-Plus characteristic;



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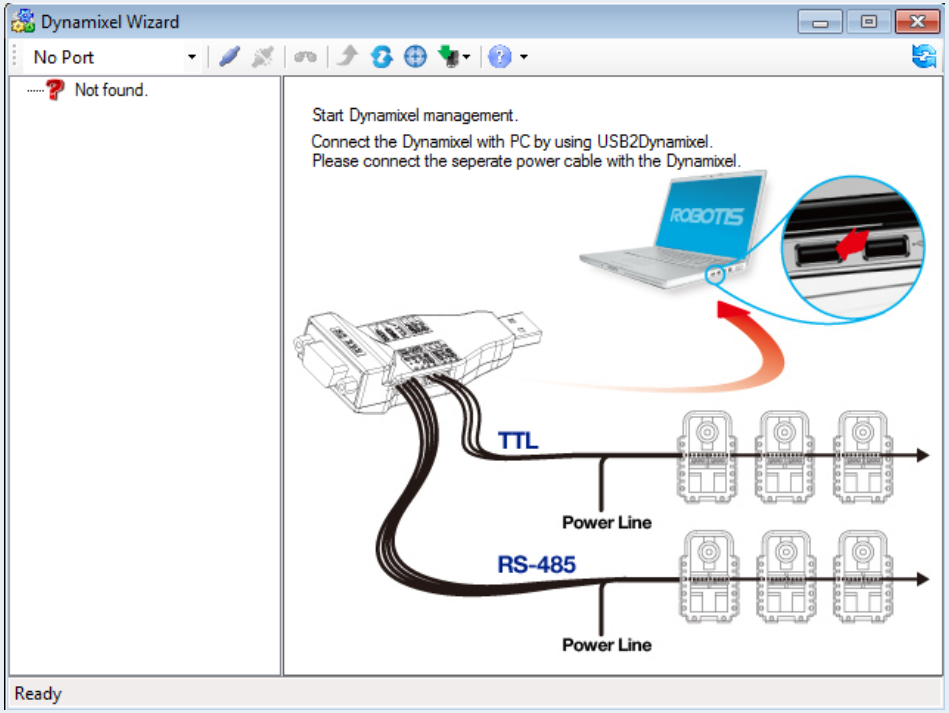
➢ Robo-Plus;

- Robo-Plus characteristic;



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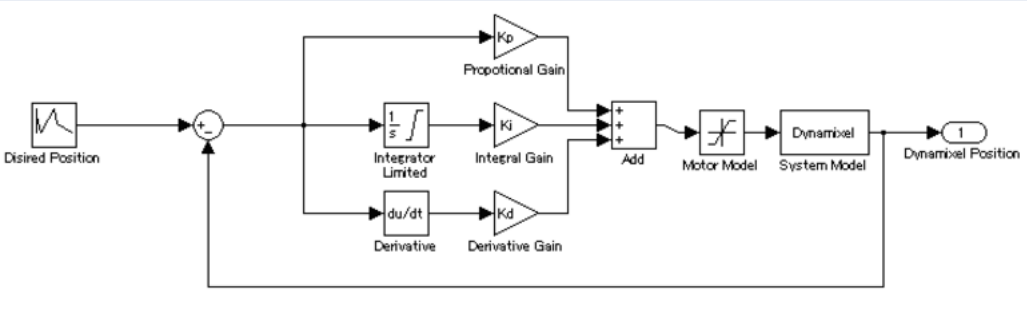
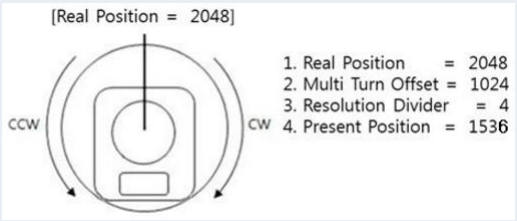
➢ Dynamixel's Calibration;

• **PID controller;**

MX series will use the PID controller as a main control method.

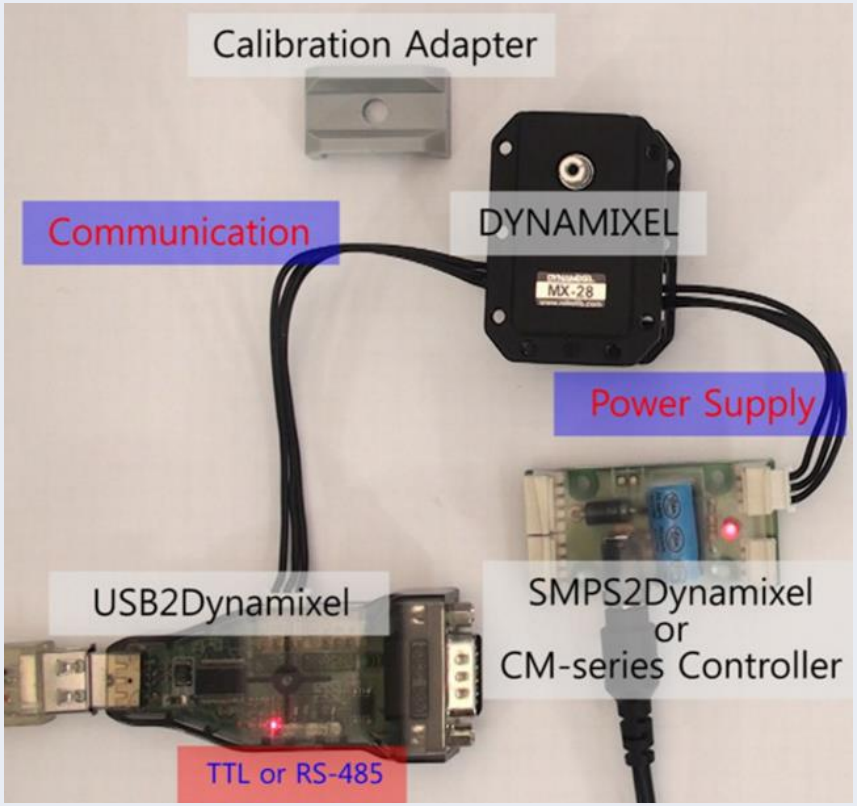
P gain refers to the value of proportional band.
I gain refers to the value of integral action.
D Gain refers to the value of derivative action.
Gains values are in between 0~254.





Source: http://support.robotis.com

- **Dynamixel's Calibration;**
  - **Hands-On;**



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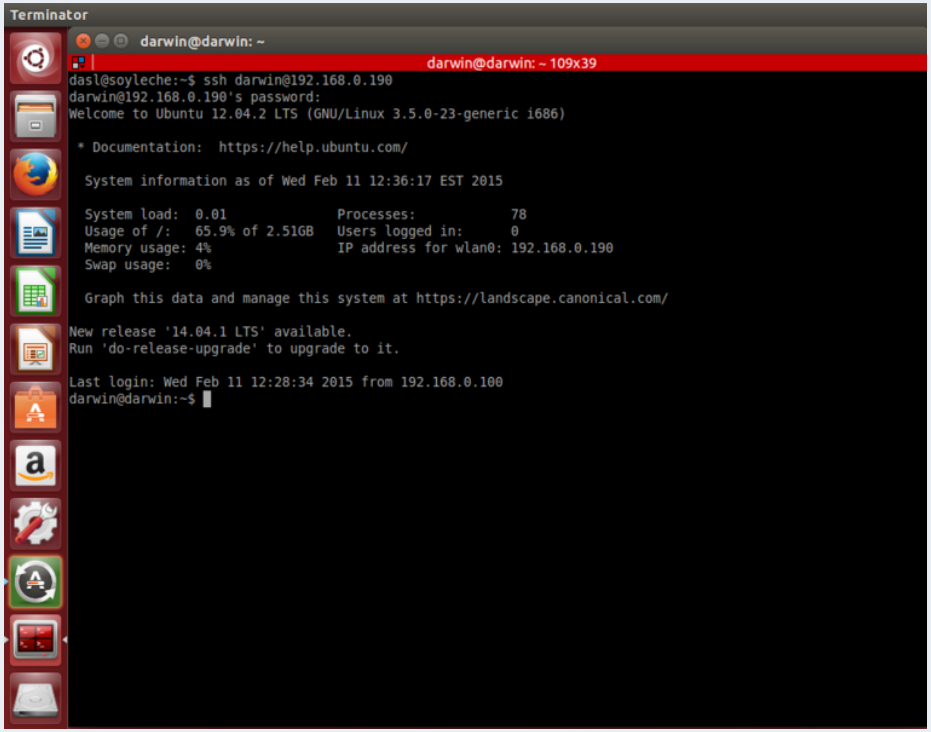
➢ DARwIn-OP & Ubuntu;

- Walkthrough;



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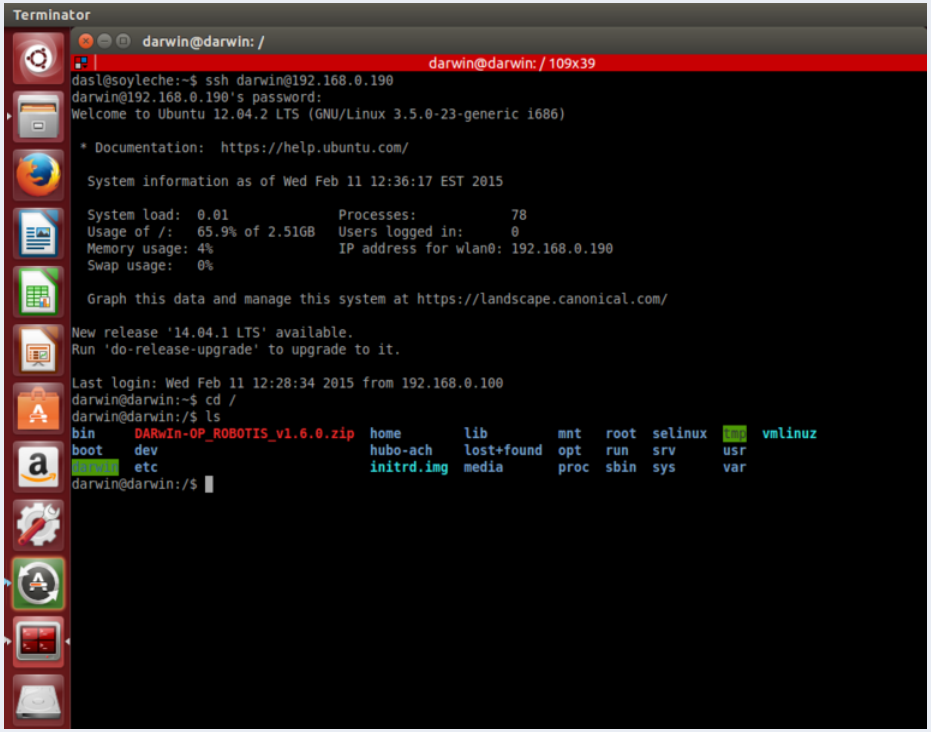
- **DARwIn-OP & Ubuntu;**
  - **Walkthrough;**



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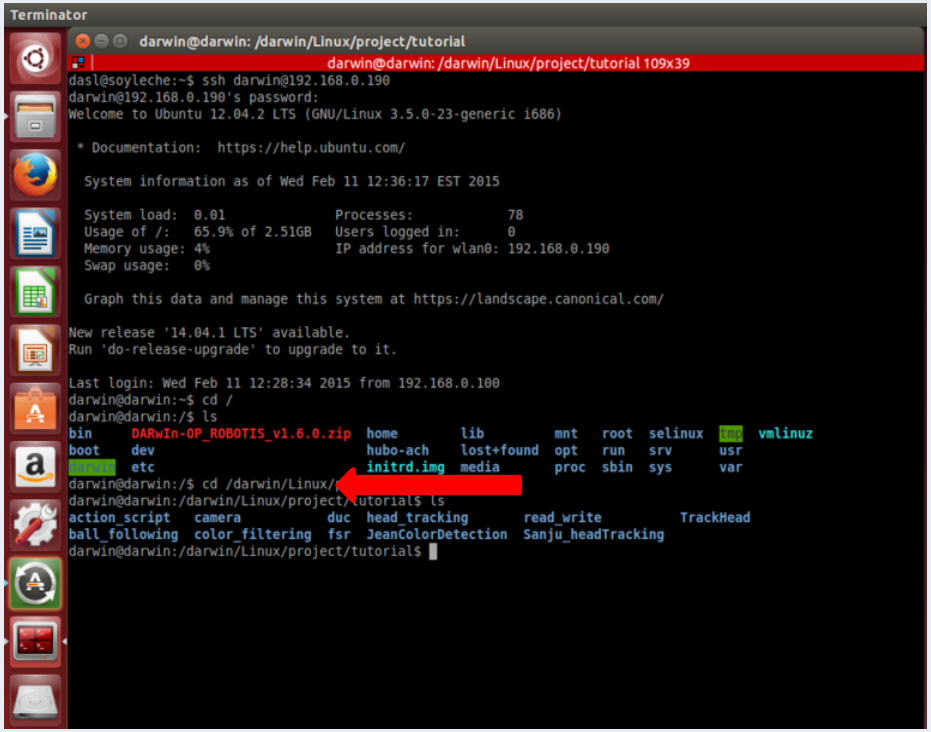
➢ Monitoring Dynamixels through DARwIn-OP;

- Walkthrough;



- http://support.robotis.com/en/software/roboplus/dynamixel_wizard/mx_calibration.htm
- http://www.trossenrobotics.com/dynamixel-mx-28-robot-actuator.aspx