SEOUL NATIONAL UNIVERSITY
SCHOOL OF MECHANICAL AND AEROSPACE ENGINEERING

SYSTEM CONTROL **Fall 2010**

HW.#3 **Assigned: October 11 (Mo)**
October 25 (Mo)

[1] Open loop control vs. Closed loop control

Consider motor control system shown in the figures below. Design open loop controller and closed loop controller.

(1) Simulate tracking of the reference signal (a) step input and (b) sinusoidal input without disturbance, and compares the results for open loop control and closed loop control.

(2) Simulate tracking of the reference signal (a) step input and (b) sinusoidal input with disturbance, and compares the results for open loop control and closed loop control.

Model parameters, the reference and disturbance signals are described in the Table.

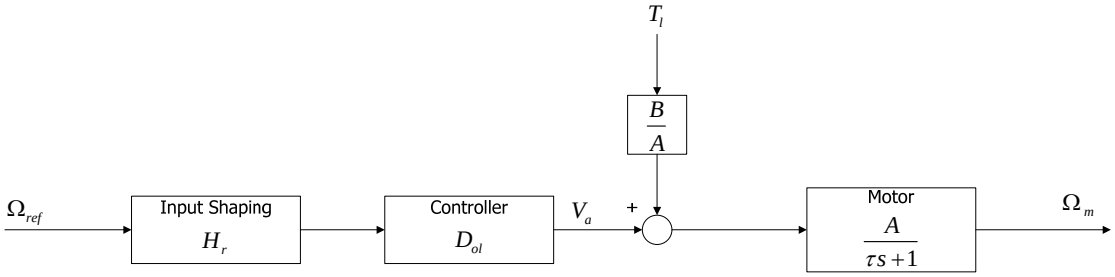

Figure 1. Open loop control structure

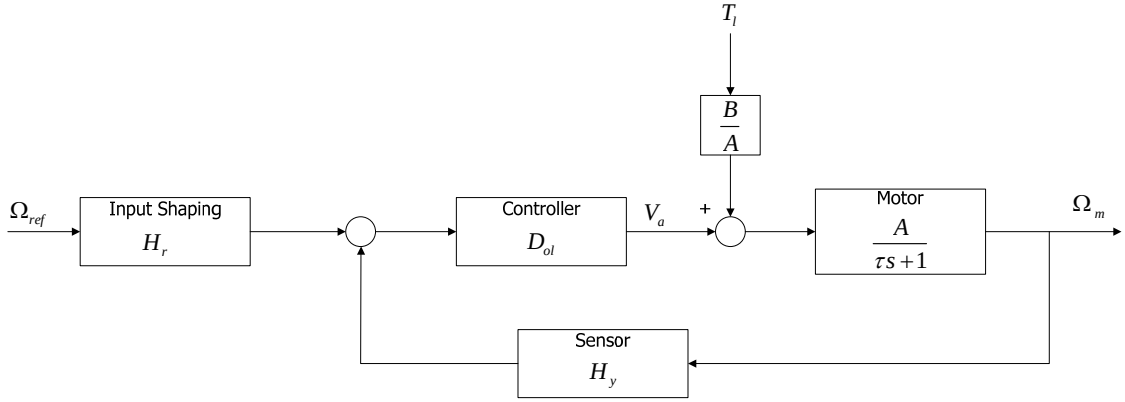

Figure 2. Closed loop control structure

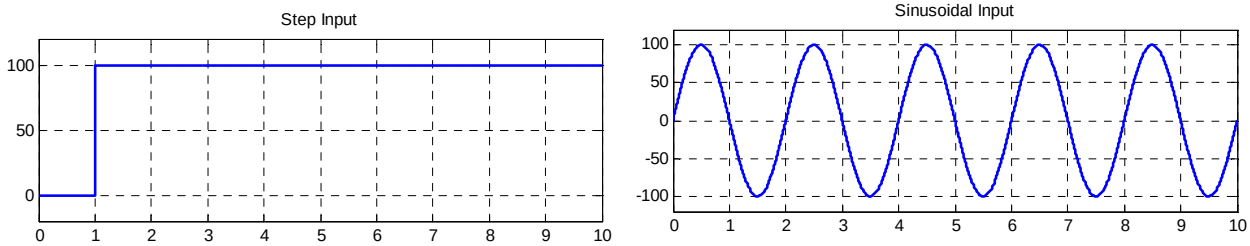

Figure 3. Reference wheel velocity (a) step input, (b) sinusoidal input

Table 1. Model parameters, the reference and disturbance signals

Model Spec	**A= 10, τ = 1/60, B=50**	
Reference Input	**Step : 100 rad/s**	**Sinusoidal : π Hz, 100 Amps**
Disturbance	**Constant : 0.1 Nm**	**Sinusoidal : π Hz, 0.1 Amps**