

Servo Position Control

4/12/25

Agenda:

- 1) Block diagram & TF
- 2) Prop. Control
 - 2nd - Order Sys behavior
 - Root-locus
- 3) Real-Time & Arduino

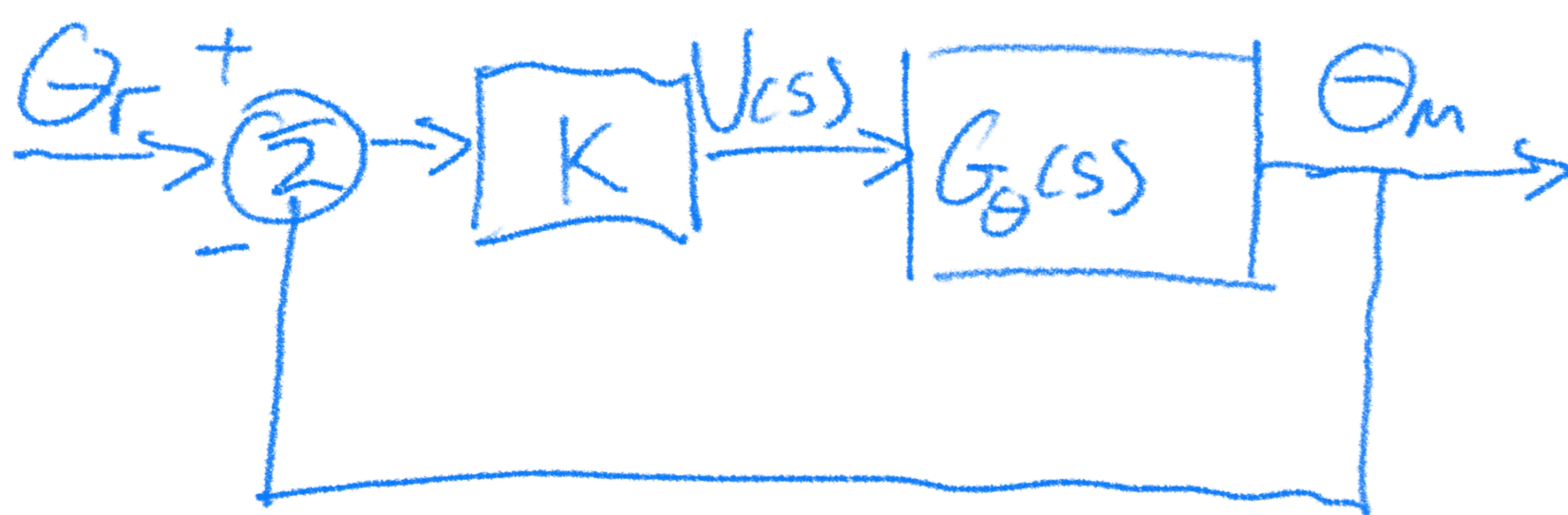
$$G_{\theta}(s) = \frac{c}{Js^2 + bs} \quad J=1, b=0.104, c=0.2$$



$$\Theta_r \begin{cases} 0 & \text{closed} \\ 1 & \text{open} \end{cases}$$



$$v = K(\Theta_r - \Theta_m) \rightarrow$$



$$\Rightarrow H_{css} = \frac{KG}{1+KG} = \frac{Kc}{Js^2 + bs + Kc} = \frac{0.2K}{s^2 + 0.104s + 0.2K}$$

$$= \frac{\omega_n^2}{s^2 + 2\zeta\omega_n s + \omega_n^2}$$

continued on Matlab
(see GitHub)