

# Control Design Methods

1. Ziegler Nichols
2. Root Locus
3. Bode Plot
4. State Feedback
5. Optimal Control

$$\dot{x} = Ax + Bu$$

$$u = Kx$$

$$\begin{aligned}\dot{x} &= Ax + Bu \\ y &= Cx + Du\end{aligned}$$

$$\dot{x} = Ax + BKx$$

$$\dot{x} = (A + BK)x$$

State estimation

$$u = Kx$$

$$y = Cx + Du$$

Cost function  
for  $y$  and  $u$   
optimal  $K$

Kalman Filter