

Day 20

Observers

AE353

Spring 2022

Bretl

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

until now:

$$u = -Kx$$

↑ state

from now on:

$$u = -K\hat{x}$$

↑ state estimate

$$x = \begin{bmatrix} q - q_e \\ v - v_e \end{bmatrix}$$

$$y = [q - q_e]$$

$$y = \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} q - q_e \\ v - v_e \end{bmatrix}$$

$$y = Cx$$

↑ output

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

$$y = Cx$$

$$u = -K\hat{x}$$

$$\dot{\hat{x}} = A\hat{x} + Bu - L(C\hat{x} - y)$$

$$\hat{x}(t_0) = x_0$$

← OBSERVER