

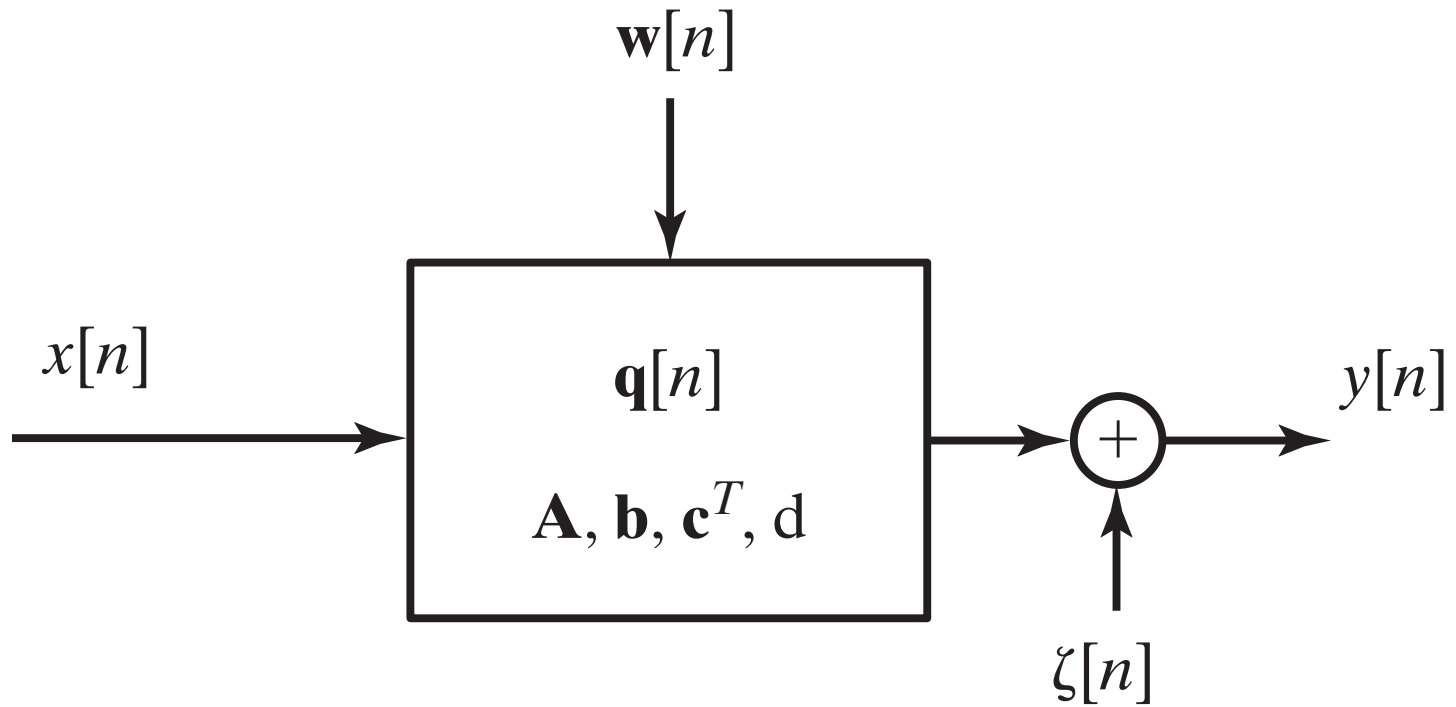
# Observers, state feedback

**6.011, Spring 2018**

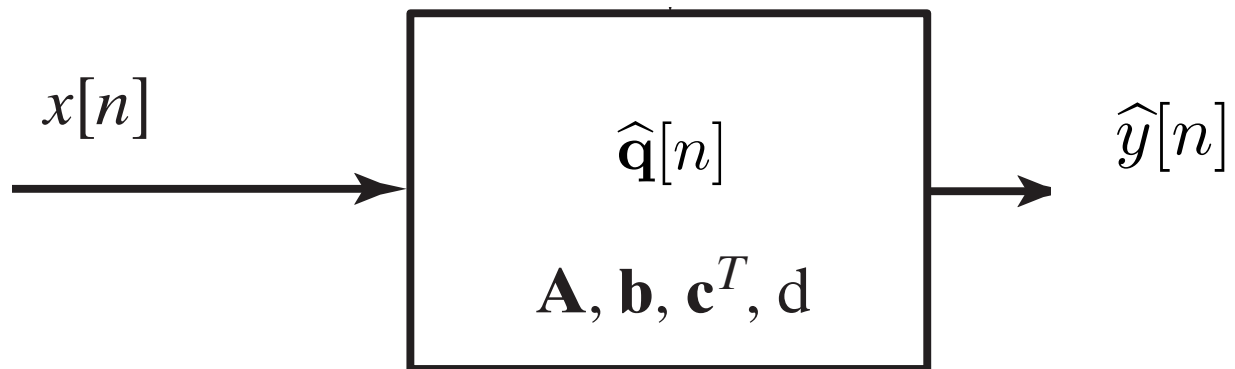
**Lec 10**

# Observers

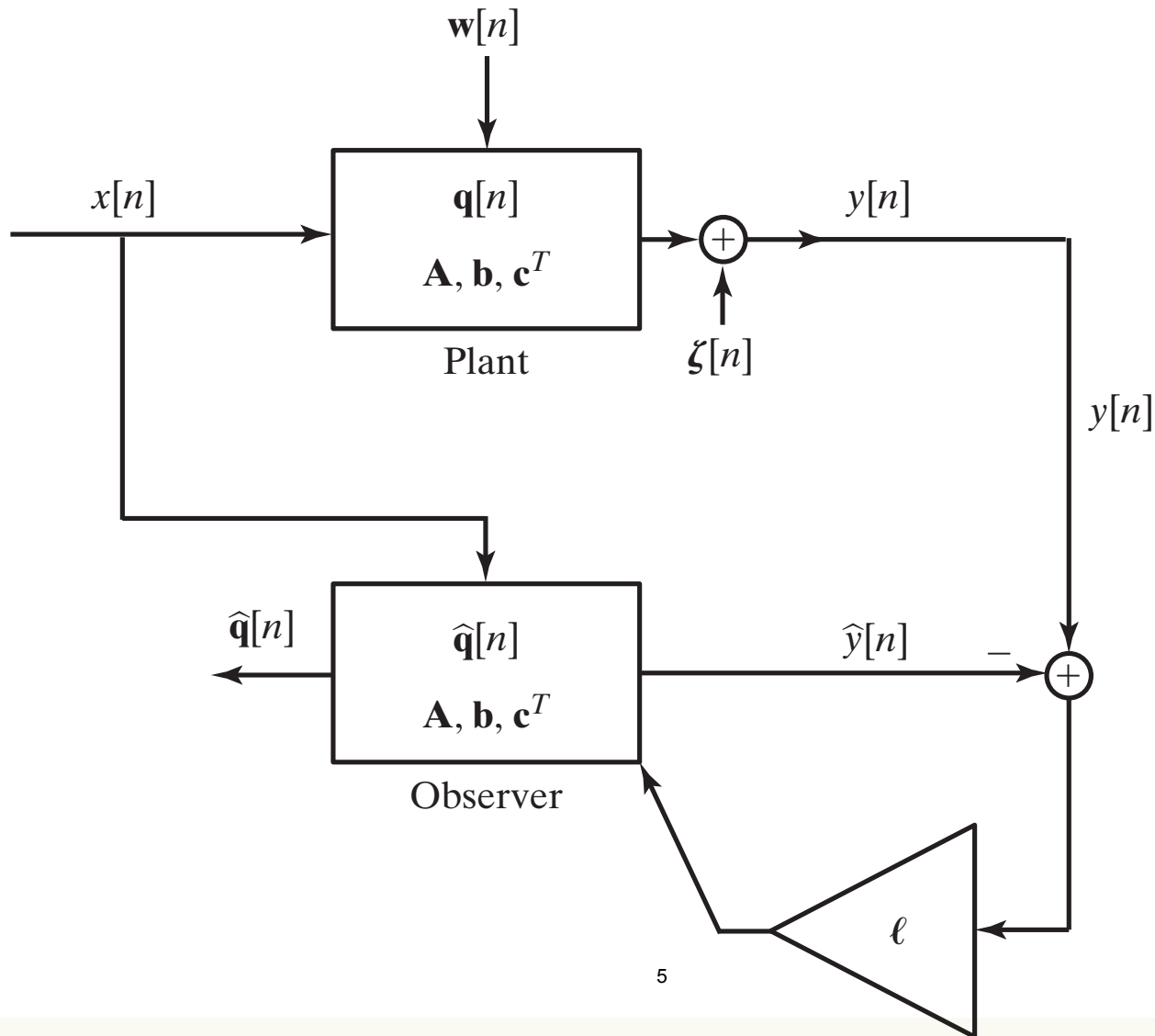
# System (“plant”)



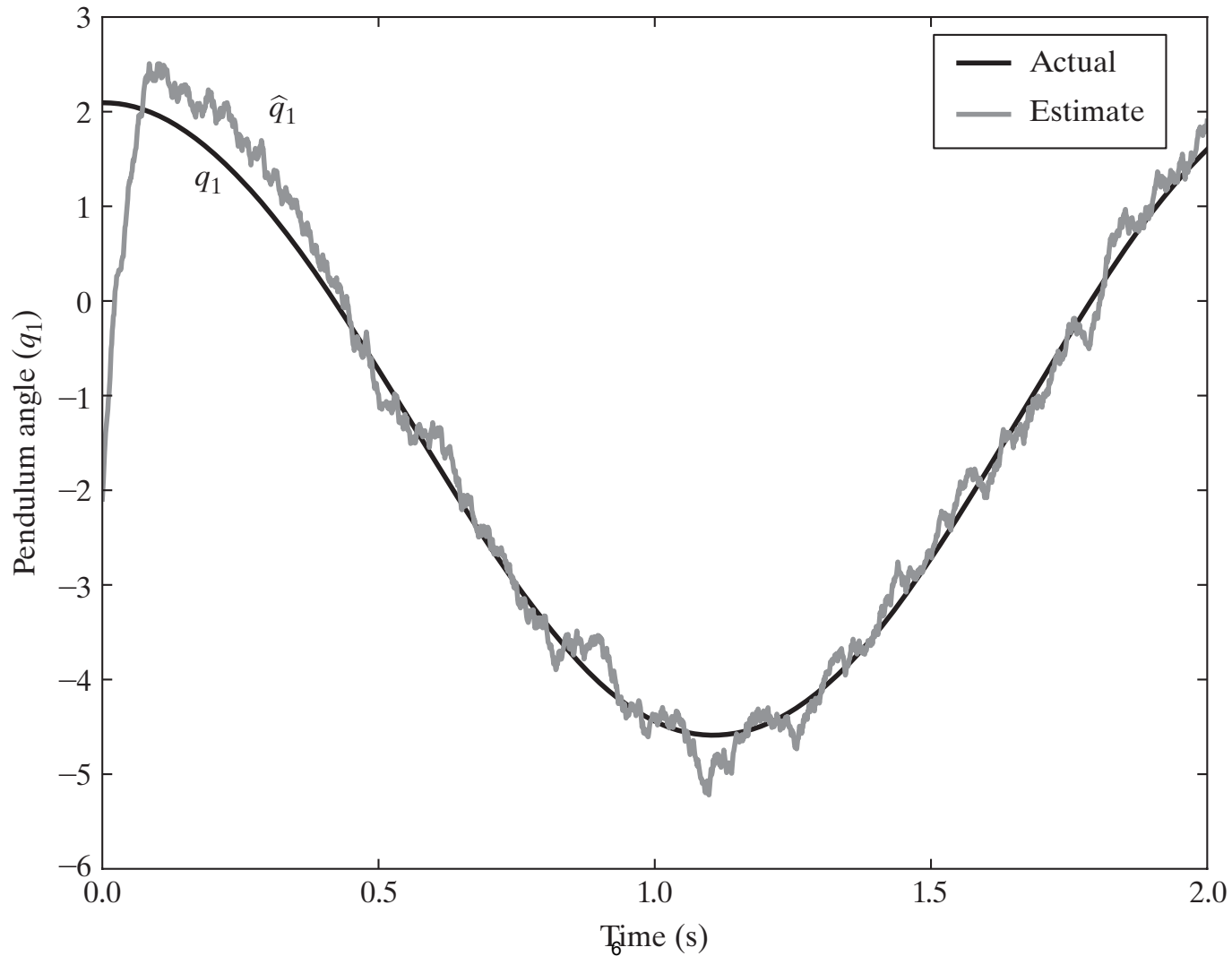
# A good model



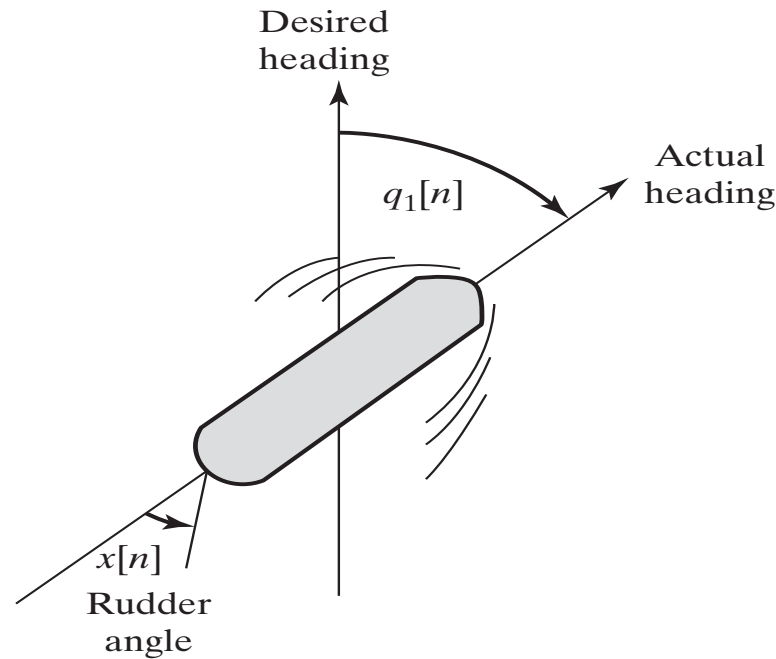
# Observer configuration



# Observer performance (with measurement noise)

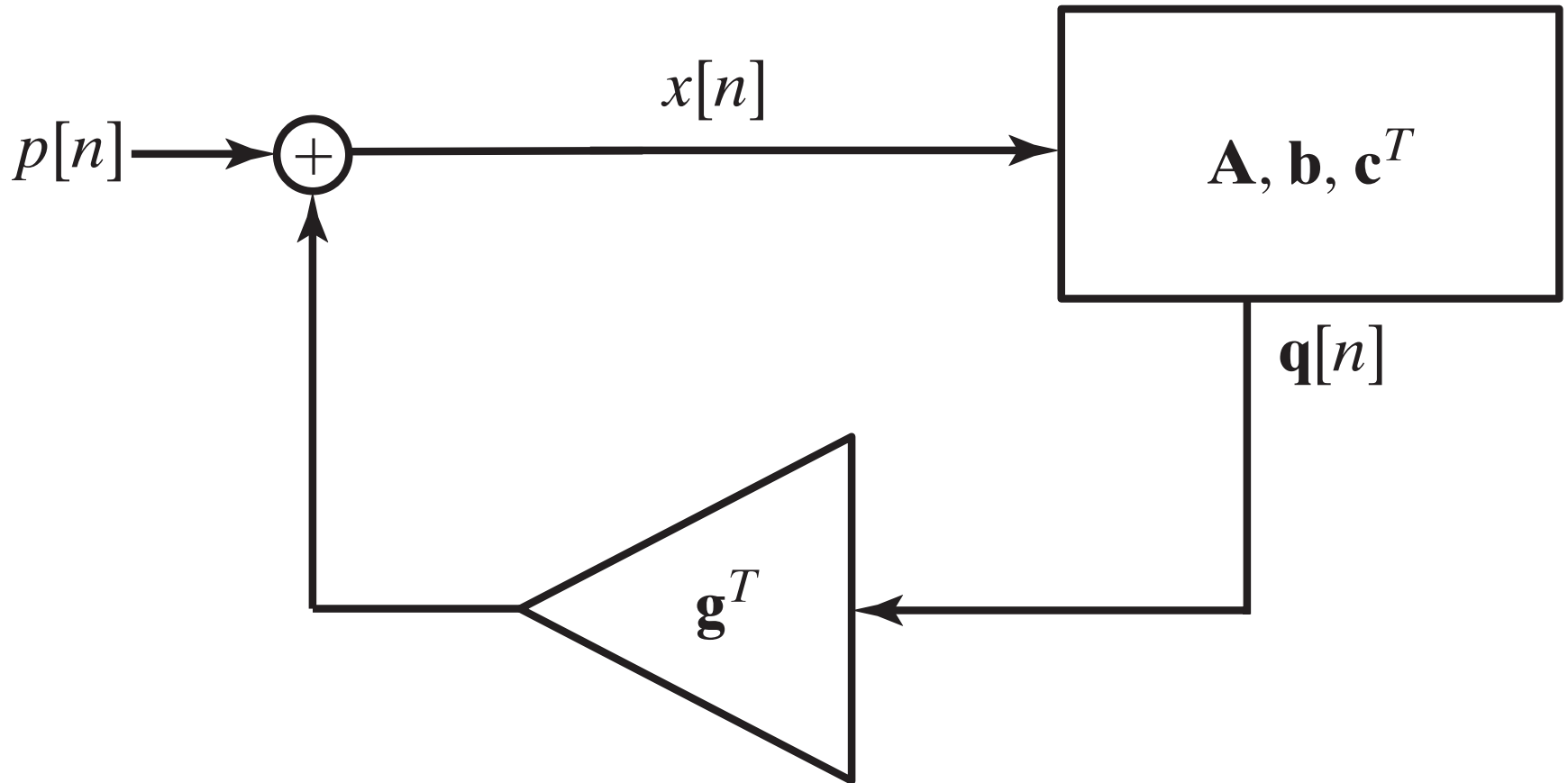


# Observer for ship heading error



$$\begin{aligned} \mathbf{q}[n + 1] &= \begin{bmatrix} q_1[n + 1] \\ q_2[n + 1] \end{bmatrix} = \begin{bmatrix} 1 & \sigma \\ 0 & \alpha \end{bmatrix} \begin{bmatrix} q_1[n] \\ q_2[n] \end{bmatrix} + \begin{bmatrix} \rho \\ \sigma \end{bmatrix} x[n] \\ &= \mathbf{A}\mathbf{q}[n] + \mathbf{b}x[n]. \end{aligned}$$

# State feedback





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6.011 Signals, Systems and Inference  
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