_6-state-and-output-feedback

goal: design stabilizing controllers and estimating observers

1°: state feedback [AMv2 Ch 7] [Nv7 Ch 12.2]
- 1!: stabilization
- 1²: integral feedback

2°: output feedback [AMv2 Ch 8] [Nv7 Ch 12.5]
- 2!: observer design
- 2²: closing the loop

1°: state feedback

- as we've seen, the roots of an LTI system's characteristic polynomial govern its behavior, e.g. stability

→ we'll build tools that enable us to place these roots where we want them (& determine when/if it's possible to do so)

11. stabilization

1². integral feedback

2°: output feedback

- sensing is expensive – it's rarely practical or affordable to directly measure every state variable

→ we'll derive tools that enable us to estimate & control the system

state using a small number of outputs

2! observers

2^2. closing the loop

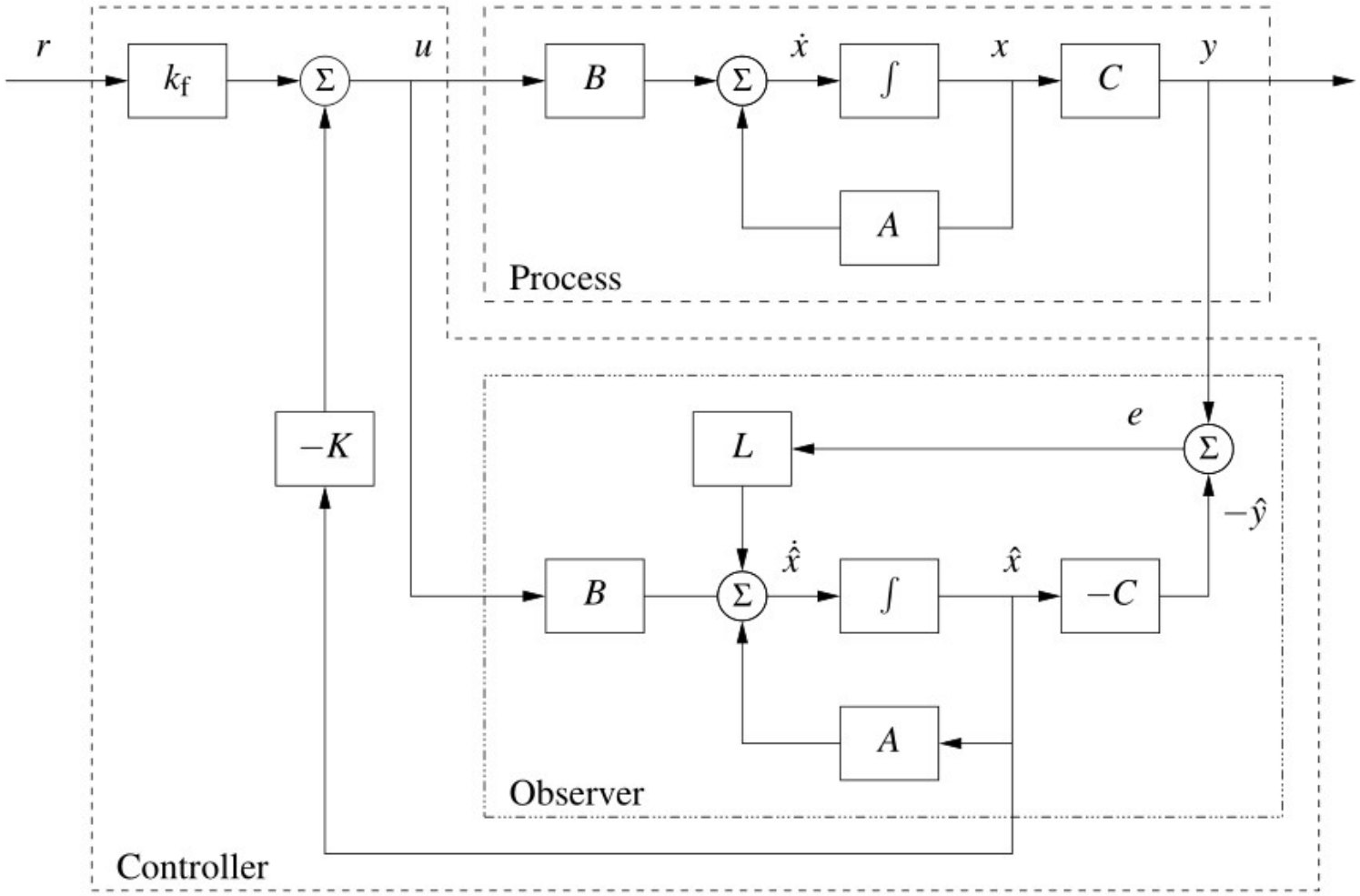

Figure 8.7: Block diagram of an observer-based control system. The observer uses the measured output y and the input u to construct an estimate of the state. This estimate is used by a state feedback controller to generate the corrective input. The controller consists of the observer and the state feedback; the observer is identical to that in Figure 8.5.