



**Model-based Information Estimate**




$$\log \frac{P(x|s)}{P(x)}$$

**Singie Trajectory Mini**

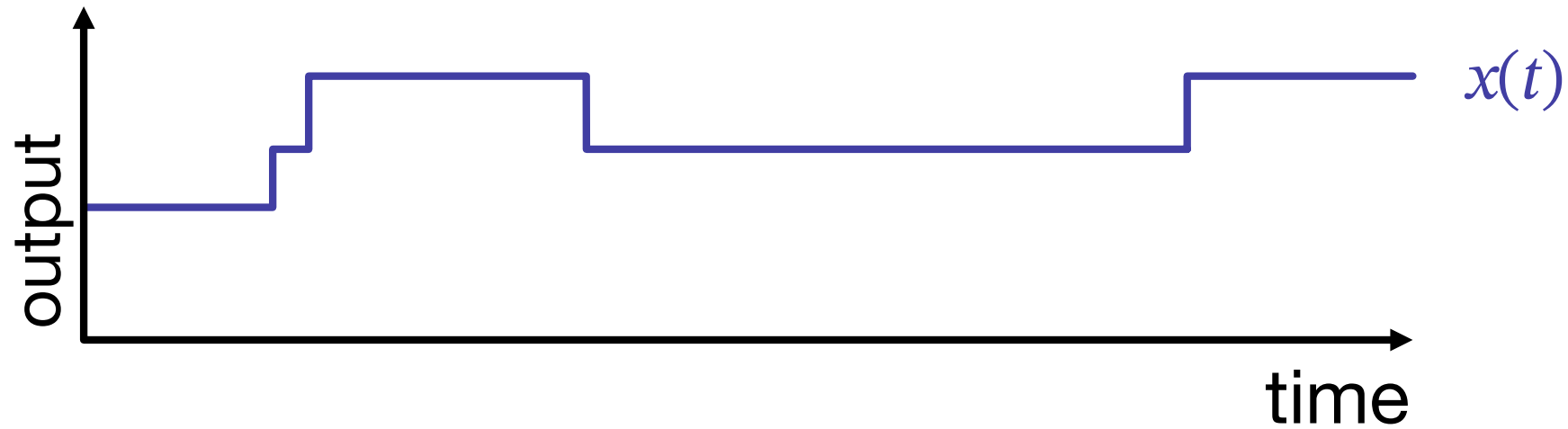
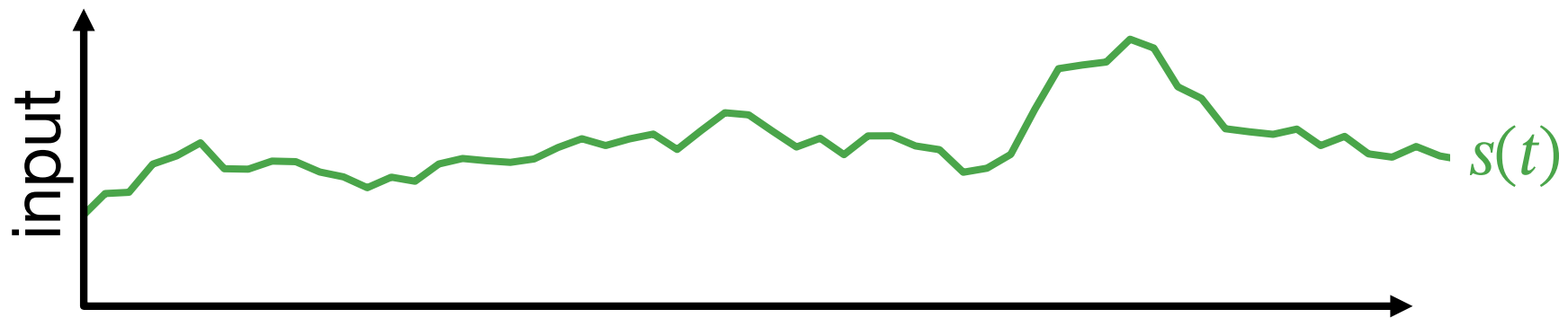
Model the information processing network using a master equation

stochastic description well-mixed reaction networks

- From the master equation, we directly compute  $P(x|s)$  



• However, we cannot directly compute  $P(x)$ ! 

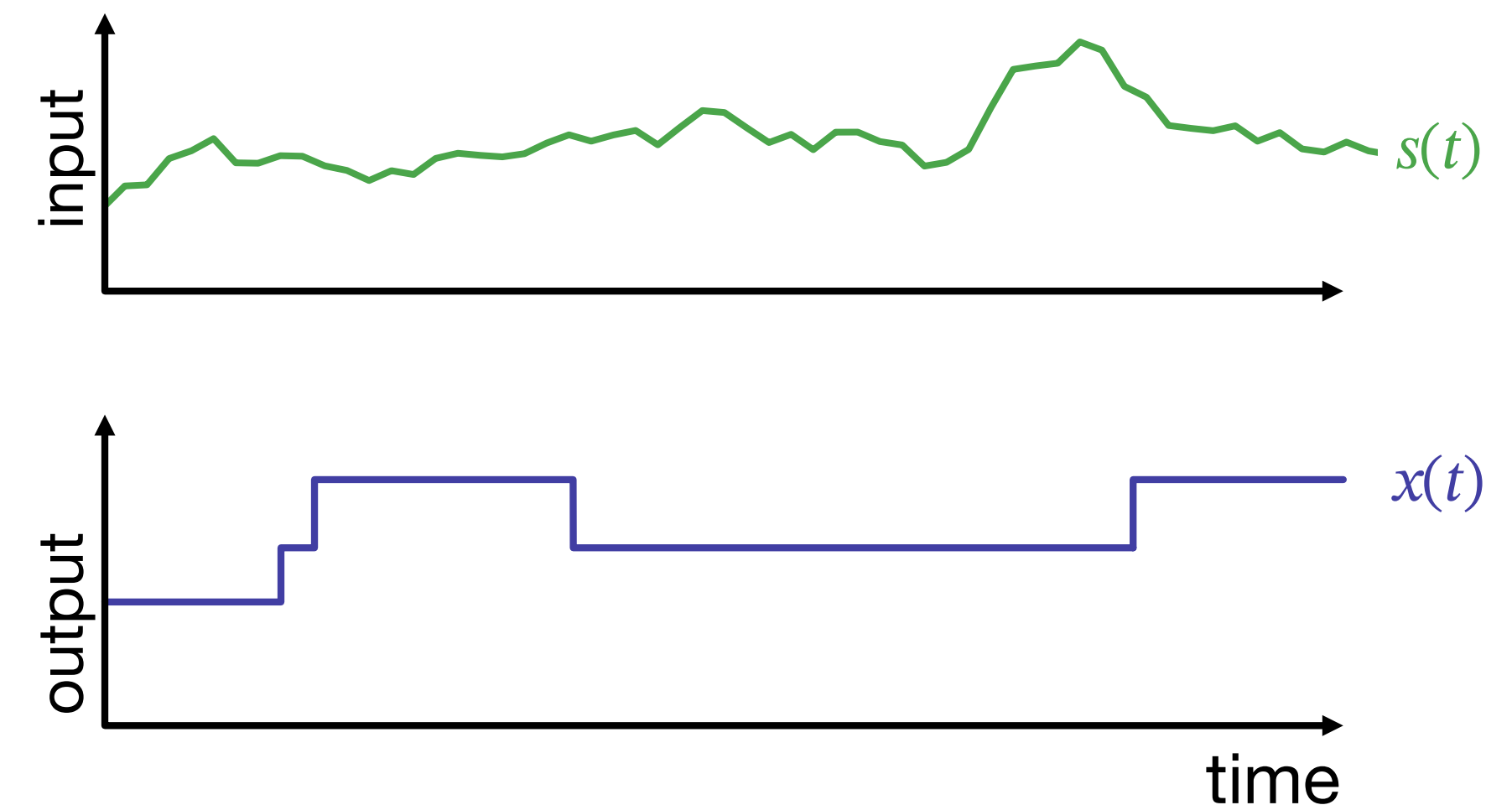


# Model-based Information Estimate

## Single Trajectory MI

$$\log \frac{P(x|s)}{P(x)}$$

- We model the information processing network using a **master equation**
  - stochastic description well-mixed reaction networks
- From the master equation, we directly compute  $P(x|s)$  ✓
- However, we cannot directly compute  $P(x)$ ! ✗



# Model-based Information Estimate

Computing  $P(x)$

$$P(x) = \sum_s P(s)P(x|s)$$