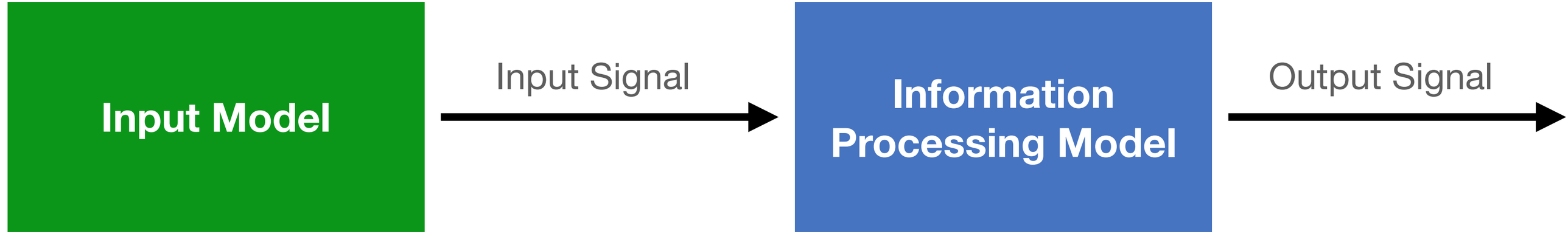
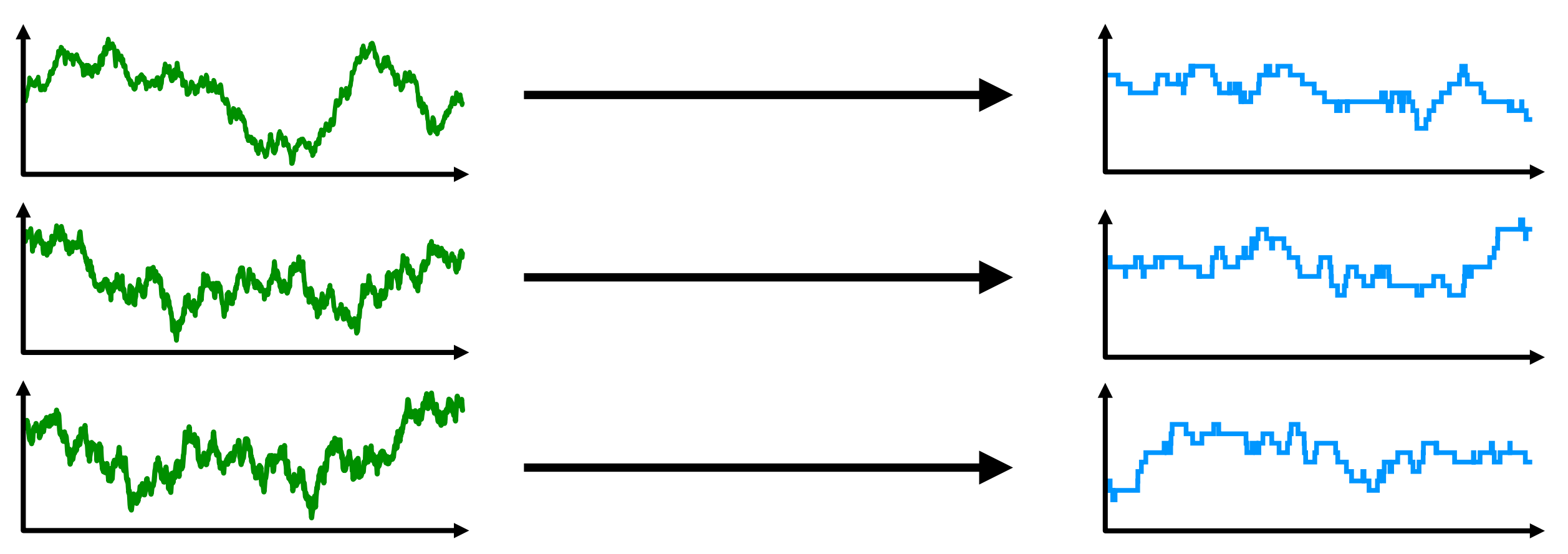
Model-based Information Estimate

- Use a stochastic model to describe the input *and* output signals


Input Model
Input Signal
Information Processing Model
Output Signal



$$\mathrm{I} = \sum_{s,x} \mathrm{P}(s)\mathrm{P}(x|s) \log \frac{\mathrm{P}(x|s)}{\mathrm{P}(x)}$$

$$\mathrm{I} = \left\langle \log \frac{\mathrm{P}(x|s)}{\mathrm{P}(x)} \right\rangle_{\mathrm{Model}}$$

$\mathrm{P}(s)$ $\mathrm{P}(x|s)$

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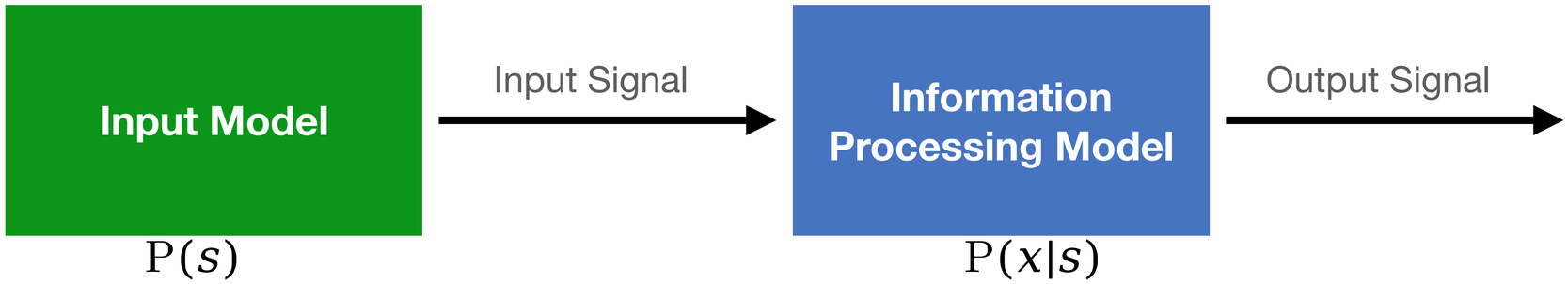

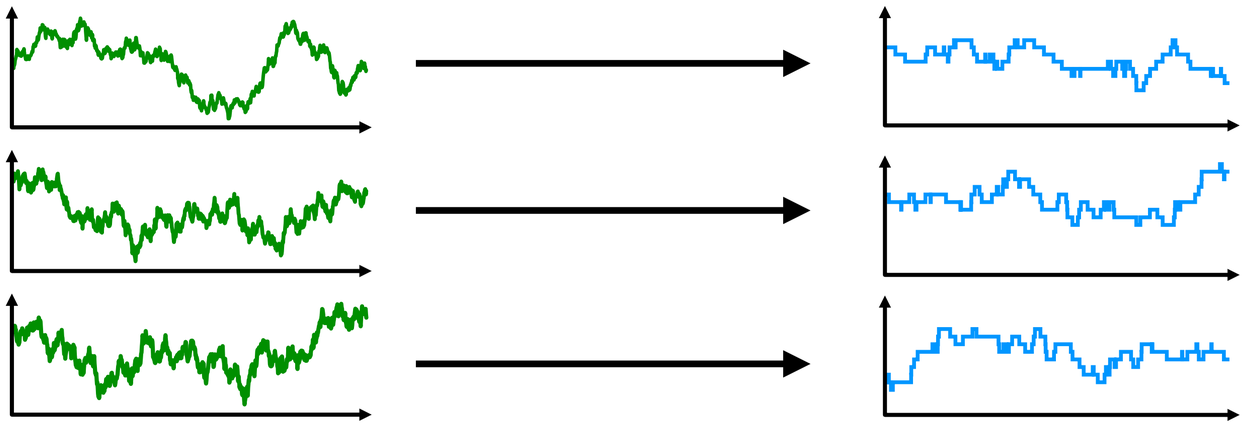

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Model-based Information Estimate

Single Trajectory MI

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