CONVERGENCE

17

- **Data processing inequality:** for any kernel K and $\mu, \mu' \in \mathscr{P}(\mathbb{X})$

$$D_f(\mu' K \| \mu K) \leq D_f(\mu' \| \mu)$$

- Therefore, if K is π-invariant, then $\pi = \pi K$ and,

$$D_f(\pi \| K\mu) \leq D_f(\pi \| \mu)$$

- A π-Invariant kernel can not push you away from target!

- If $X \sim \mu$ and K is π-invariant, is $X' \sim K(X, \mathrm{d}x')$ closer to π than X?

- **BUT** invariance alone does not guarantee that it will bring you closer either.

- Example: if $K(x, \mathrm{d}x) = \delta_x(\mathrm{d}x')$ is the identity kernel, then $\mu K = \mu$ and hence,

$$D_f(\pi \| K\mu) = D_f(\pi \| \mu)$$

CONVERGENCE

- If $X \sim \mu$ and K is π-invariant, is $X' \sim K(X, \mathrm{d}x')$ closer to π than X?

- **Data processing inequality:** for any kernel K and $\mu, \mu' \in \mathscr{P}(\mathbb{X})$

$$D_f(\mu' K \| \mu K) \leq D_f(\mu' \| \mu)$$

- Therefore, if K is π-invariant, then $\pi = \pi K$ and,

$$D_f(\pi \| K\mu) \leq D_f(\pi \| \mu)$$

- A π-Invariant kernel can not push you away from target!

- **BUT** invariance alone does not guarantee that it will bring you closer either.

  - Example: if $K(x, \mathrm{d}x) = \delta_x(\mathrm{d}x')$ is the identity kernel, then $\mu K = \mu$ and hence,

$$D_f(\pi \| K\mu) = D_f(\pi \| \mu)$$

CONVERGENCE OF MARKOV CHAINS