

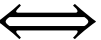






► **Identity kernel:**

$$K(x, dx') = \delta_x(dx')$$



1. Input  $X$
2. Return  $X' = X$

► **Transport kernel:** Given  $T : \mathbb{X} \rightarrow \mathbb{X}$

$$K(x, dx) = \delta_{T(x)}(dx')$$



1. Input  $X$
2. Return  $X' = T(X)$

► **Independent kernel:** Given  $\eta \in \mathcal{P}(X)$

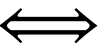
$$K(x, dx') = \eta(dx')$$



1. Input  $X$
2. Return  $X' \sim \eta$

► **Random Walk:** If  $\mathbb{X} = \mathbb{R}^d$

$$K(x, dx') = N(\mu(x), \Sigma(x), dx')$$



1. Input  $X$
2. Return  $X' \sim N(\mu(X), \Sigma(X))$

# EXAMPLES:

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► **Identity kernel:**

$$K(x, dx') = \delta_x(dx')$$

$\iff$

1. Input  $X$
2. Return  $X' = X$

► **Transport kernel:** Given  $T : \mathbb{X} \rightarrow \mathbb{X}$

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1. Input  $X$
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► **Independent kernel:** Given  $\eta \in \mathcal{P}(\mathbb{X})$

$$K(x, dx') = \eta(dx')$$

$\iff$

1. Input  $X$
2. Return  $X' \sim \eta$

► **Random Walk:** If  $\mathbb{X} = \mathbb{R}^d$

$$K(x, dx') = N(\mu(x), \Sigma(x), dx')$$

$\iff$

1. Input  $X$
2. Return  $X' \sim N(\mu(X), \Sigma(X))$



# MARKOV KERNELS V3: OPERATORS