Original form

$z \sim q_\phi(\mathbf{z}|\mathbf{x})$

Reparameterized form

Backprop

$\nabla_{\mathbf{z}} f$

$\mathbf{z} = \mathbf{g}(\boldsymbol{\phi}, \mathbf{x}, \boldsymbol{\varepsilon})$

$\nabla_{\boldsymbol{\phi}} f$

$\boldsymbol{\varepsilon} \sim p(\boldsymbol{\varepsilon})$

◇ : Deterministic node   → : Evaluation of f

● : Random node   → : Differentiation of f