

Siddhant Mishra-Sharma (MIT/AI FI) Summer School

/66

2

1

A Bayesian latent-variable model optimized with variational inference



A diagram showing a large rounded rectangle representing a set N . Inside this rectangle are two circles. The left circle is dark gray and contains the letter z . The right circle is blue and contains the letter x . The letter N is located in the top right corner of the rectangle.

z

x

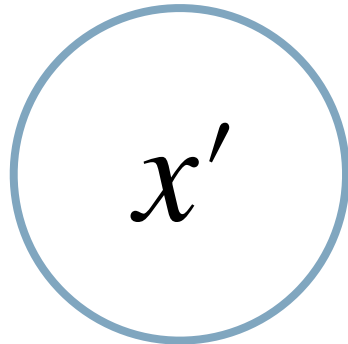
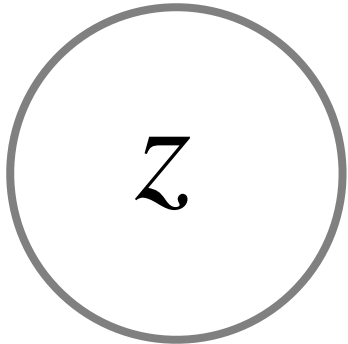
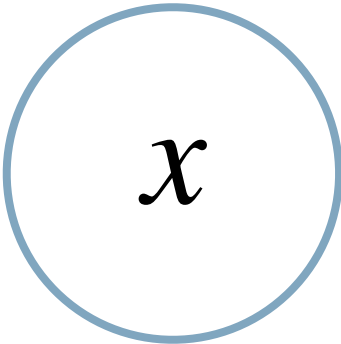
N

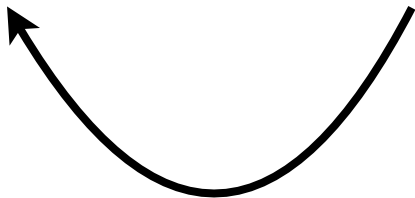
Maximizing ELBO

\equiv Minimizing *reverse* KL

\equiv Aligning the forward and reverse processes

$$\textit{Minimize} \quad \left\langle \log \frac{q(x, z)}{p(x, z)} \right\rangle$$





$$q_{\phi}(z \mid x) \cdot p(x)$$

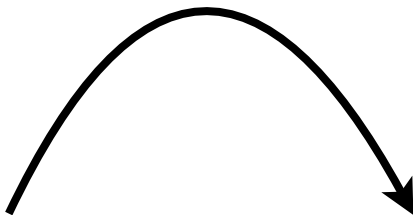
Forward process

It's so over

We're so back

Reverse process

$$p_{\vartheta}(x | z) \cdot p(z)$$

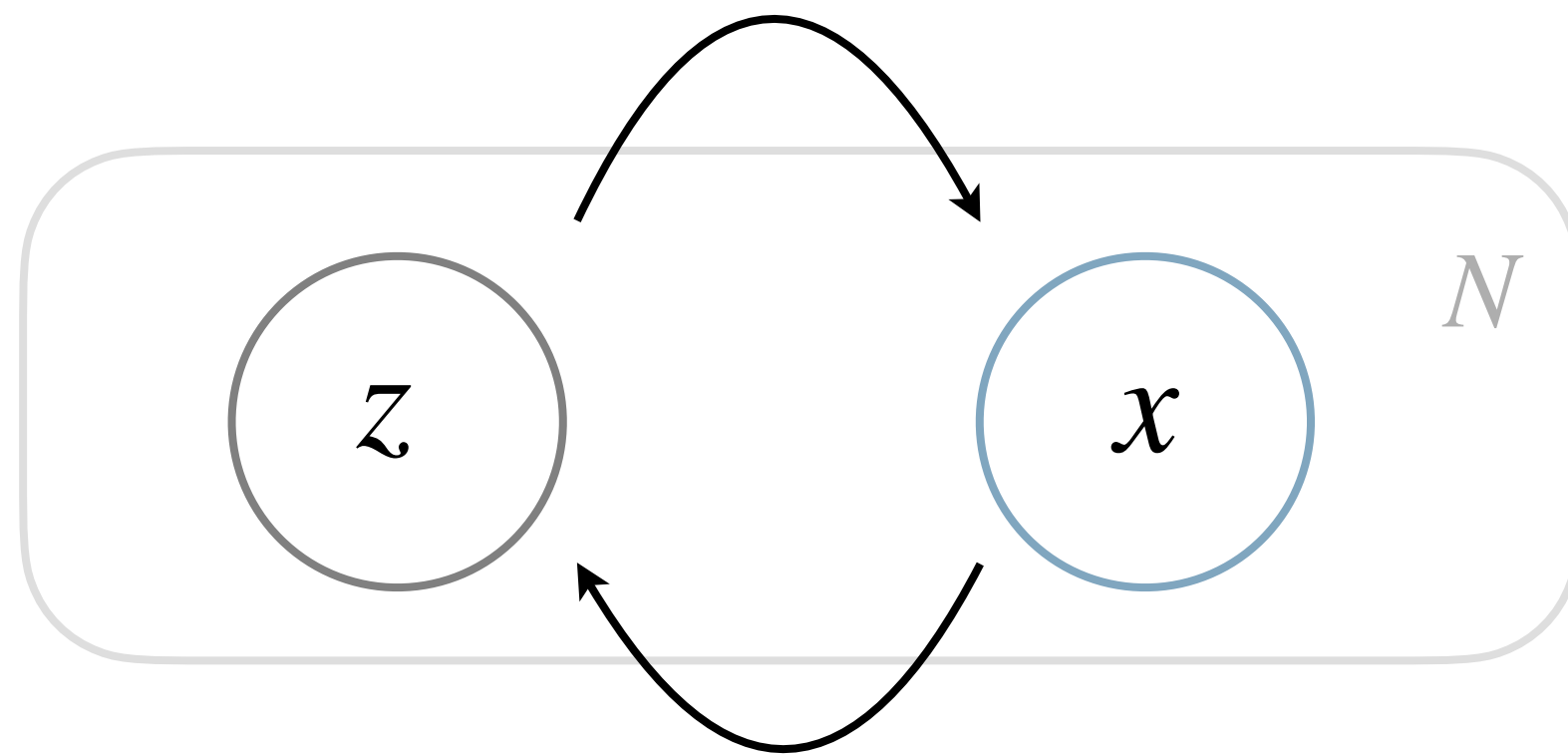


A Bayesian latent-variable model optimized with variational inference

We're so back

Reverse process

$$p_{\theta}(x | z) \cdot p(z)$$



$$q_{\phi}(z | x) \cdot p(x)$$

Forward process

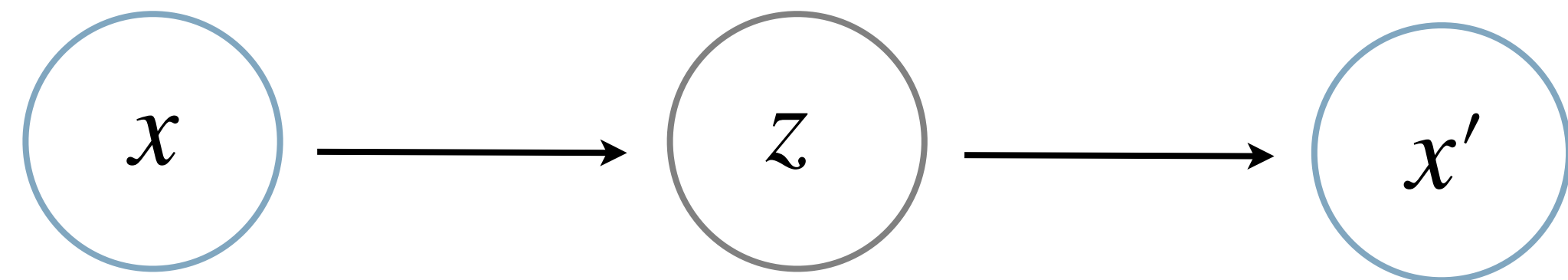
It's so over

Maximizing ELBO

\equiv Minimizing *reverse* KL

\equiv Aligning the forward and reverse processes

$$\text{Minimize} \quad \left\langle \log \frac{q(x, z)}{p(x, z)} \right\rangle$$





Christopher Yau

@cwcyau

People do realise that a variational autoencoder comes from the application of variational inference to a Bayesian latent variable model right? It isn't an arbitrary loss function with a KL term stuck on to it with a tweakable parameter to balance the two?



Julian Togelius @togelius · Sep 22, 2021

No. I think of it as an arbitrary loss function and it works well for me. I'm in favor of arbitrary loss functions.

1 1 16



Julian Togelius @togelius · Sep 22, 2021

No. I think of it as an arbitrary loss function and it works well for me. I'm in favor of arbitrary loss functions.

1 1 16



Yann LeCun @ylecun · Sep 22, 2021

I concur.

6

