EWa Szczurek

VAEs

Omg, a legend

$c_i \sim$ categorical dist $(\pi_1 \dots \pi_k)$ mixed dists

as in an actual key of notation

Heavy on the probability theory

very sudden

$\underline{X}, \underline{Z}$ vec of random variable

x :

$P(X, z) = P(X|z)P(z)$

$P(x) = \sum_{z} P(x, z)$

$P(z|x) =$ Bayes

"Functional"

- takes a func as an input & returns a value
- e.g. KL-div

"Variational"

- Max/min a functional

$\underline{X}$: observed vec

$\underline{Z}$: hidden vec

ELBO : $-\mathbb{E}_Q[\log Q(z) - \log P(z,x)]$

Approx dist z (unobserved)

by variational inference of posterior $Q(z)$

"Encoder" turns z into x?

$q_\varphi(z|x)$

VAE ELBO: $-\mathbb{E}_{q_\varphi}[\log q_\varphi(z|x) - \log p_{\theta,\psi}(z,x)$

$=$

Same

mostly

Ok so it does use max Ent

Ok so it appears we have some dist we desire

to encode we take distributions of the input data

those bottleneck in the autoencoder: Z

and then we use the ELBO to decode Z for some approx prior X

Interesting!

Gauss Mix VAE

Semi-Supe GMMVAE

K. koras et al 2022

ArXiv

- A "guiding" dataset