Generative AI
Generative AI

- Autoencoder
- Dim Reduction
- CVAE
- GANs
- Conditional GANs
- EOLQs
Autoencoder

- encoder: example $\rightarrow$ latent
- decoder: latent $\rightarrow$ example
- latent structure, data submanifold, embedding space

eg, superresolution
arithmetic in latent space (R&N fig 21.9)
'embedding'

- PCA: linear
  see Mark Richardson’s PCA notes for 17d example
- IsoMap: non-linear
Conditional Autoencoder

- encoder: example, label $\rightarrow$ latent
- decoder: latent, label $\rightarrow$ example

$q_\phi(z|x,y), P_\theta(X|z,y)$: conditioned on label labels are informative and help decoder
Generative Adversarial Networks

- generator: latent/random $\rightarrow$ example
- discriminator: example $\rightarrow P(\text{real})$

generator: random images that discriminator thinks are real
discriminator: discriminate between training and generated images

example from O’Reilly book
Ting-Chun Wang’s video of semantic manipulation
Conditional GANs

- **generator**: latent, labels $\rightarrow$ example
- **discriminator**: example, labels $\rightarrow P(\text{real})$

must generate data consistent with labels
must detect example of labels
What question didn’t you get to ask today?
What’s still confusing?
What would you like to hear more about?

Please write down your most pressing question about AI and put it in the box on your way out.

Thanks!