

Generative AI

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

Generative AI

Autoencoder

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- 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)

Dimensionality Reduction

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'embedding'

- PCA: linear
see Mark Richardson's PCA notes for 17d example
- IsoMap: non-linear

Conditional Autoencoder

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- 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

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- 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

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

must generate data consistent with labels

must detect example of labels

EOLQs

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- 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!