

$$D: \bar{x} \rightarrow \%s$$

$$E_{\bar{x} \sim p_{data}} [\log D(\bar{x})] + E_{\bar{x} \sim p_g} [\log(1 - D(\bar{x}))]$$

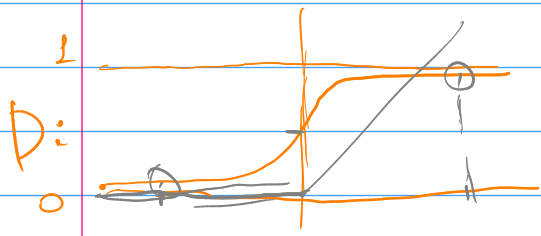
$$\min_G \max_D \left[E_{\bar{x} \sim p_{data}} [\log D(\bar{x})] + E_{\bar{z} \sim p_z} [\log(1 - D(G(\bar{z})))] \right]$$

EM? $\begin{matrix} -G \\ -D \end{matrix}$

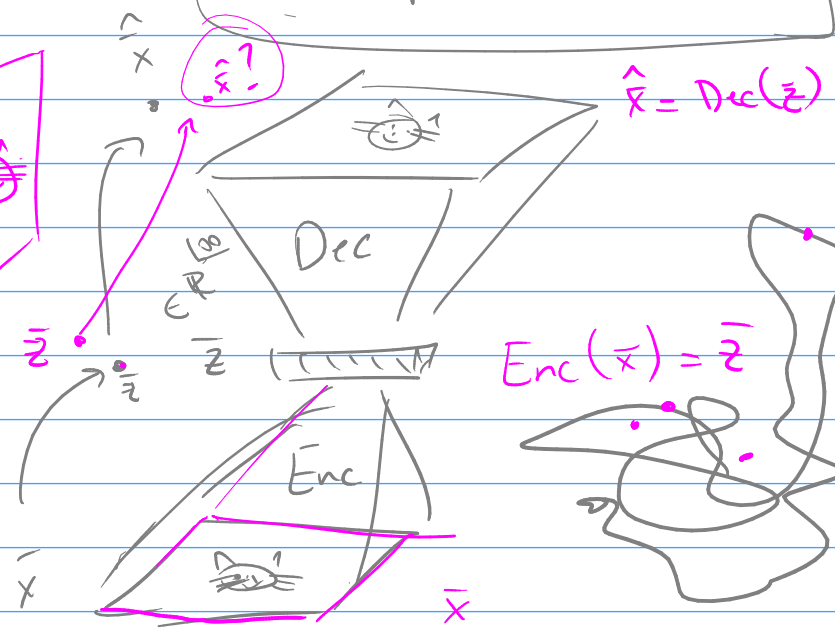
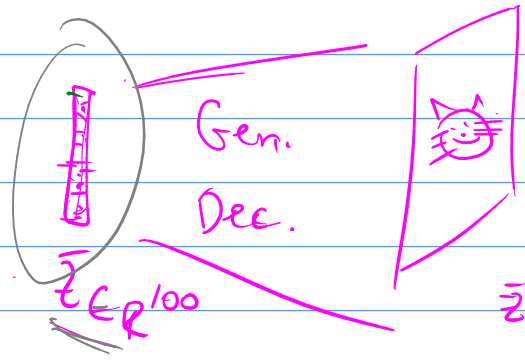
$$D_G^*(\bar{x}) = \frac{p_{data}(\bar{x})}{p_{data}(\bar{x}) + p_g(\bar{x})}$$

$$p_g = p_{data}$$

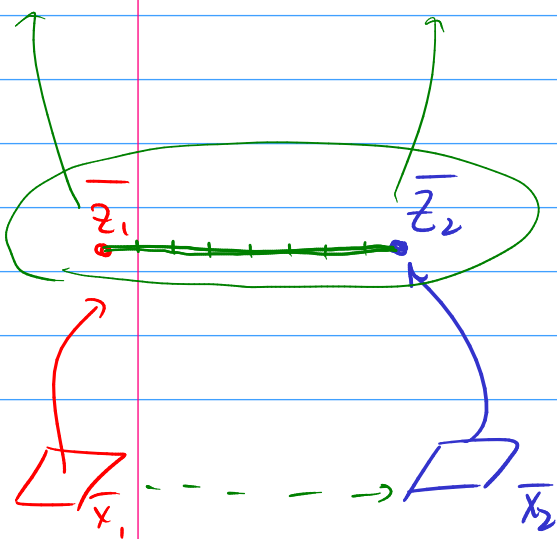
$$JSD(p_{data}, p_g) = KL\left(p_{data} \parallel \frac{p_{data} + p_g}{2}\right) + KL\left(p_g \parallel \frac{p_{data} + p_g}{2}\right)$$



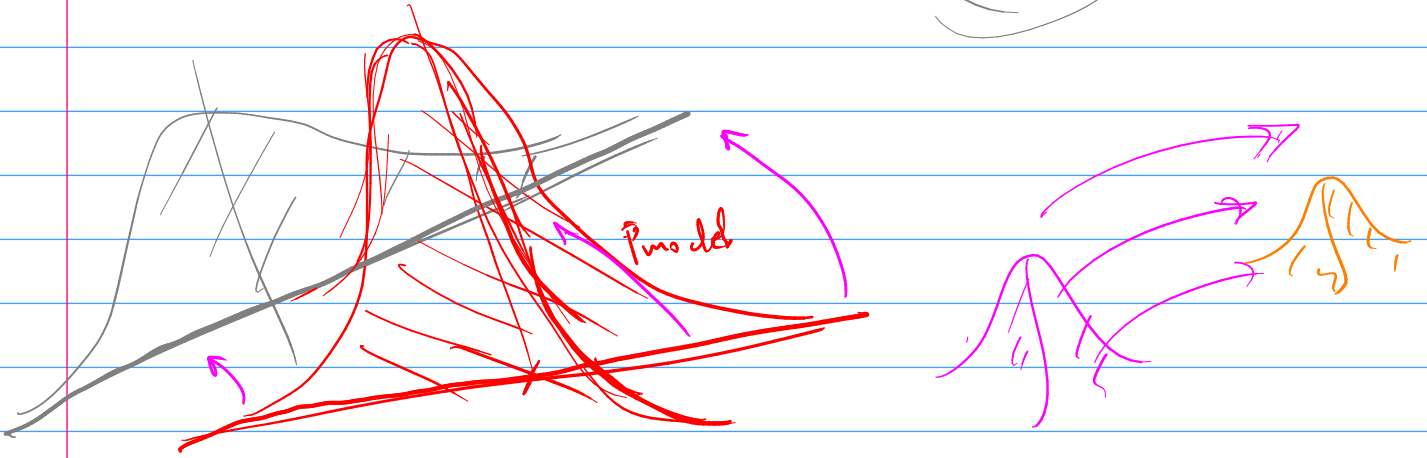
$$G: -E_{\bar{z} \sim p_z} [\log D(G(\bar{z}))]$$



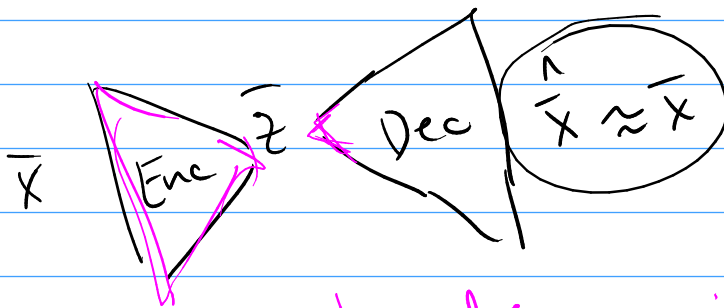
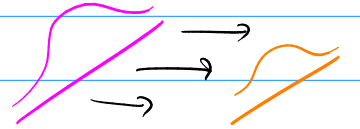
$$Enc(\bar{x}) = \bar{z}$$



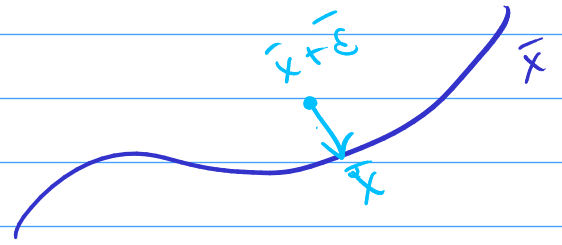
$P_{\text{model}} \approx P_{\text{data}}$
 $KL(P_{\text{data}} || P_{\text{model}}) = \int P_{\text{data}} \ln \frac{P_{\text{data}}}{P_{\text{model}}} d\bar{x}$



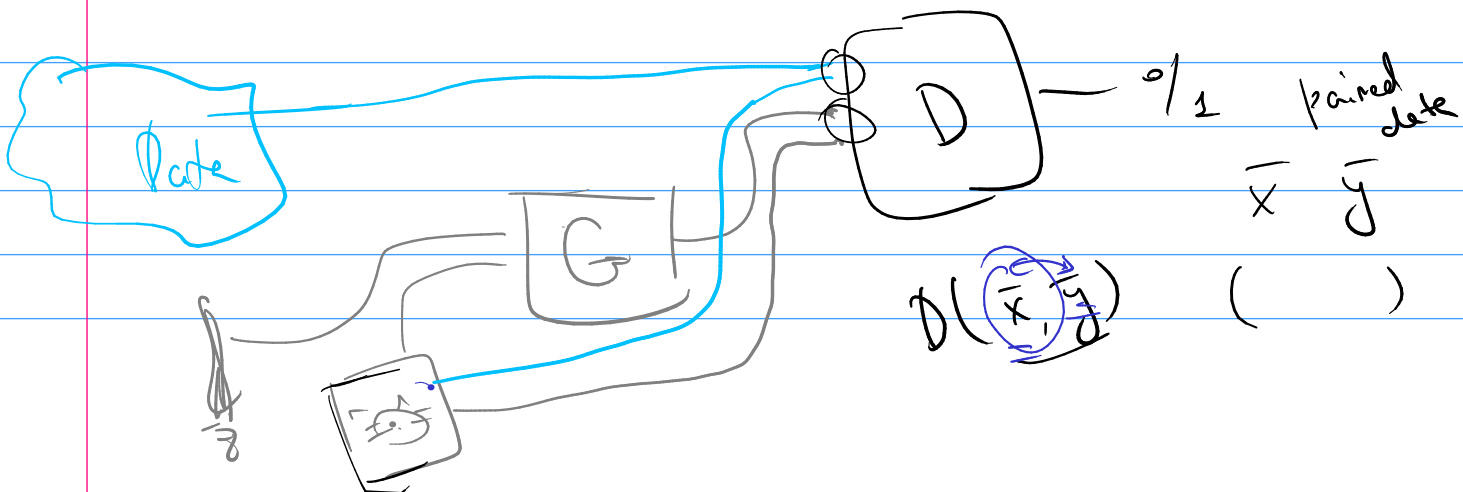
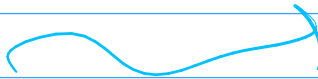
EMD - Earth Mover Distance
 Wasserstein



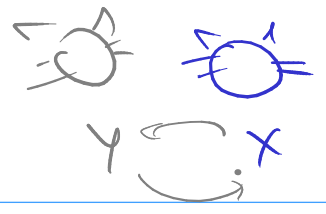
denoising autoencoders



$\bar{x} + \bar{\epsilon} \rightarrow \hat{\bar{x}} \approx \bar{x}$

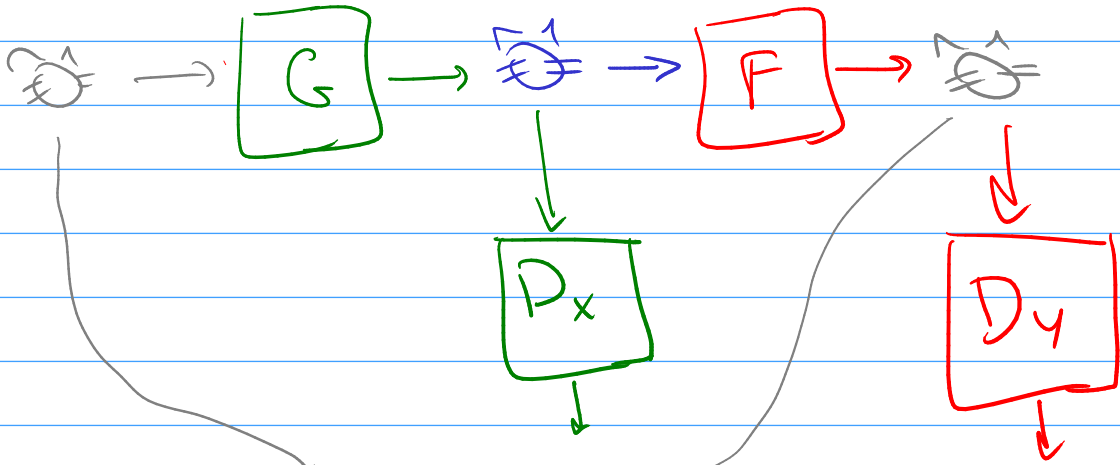


Cycle GAN



$$G: Y \rightarrow X$$

$$F: X \rightarrow Y$$



Cycle consistency loss $\| \bar{y} - F(G(\bar{y})) \|_2^2 \rightarrow \min$