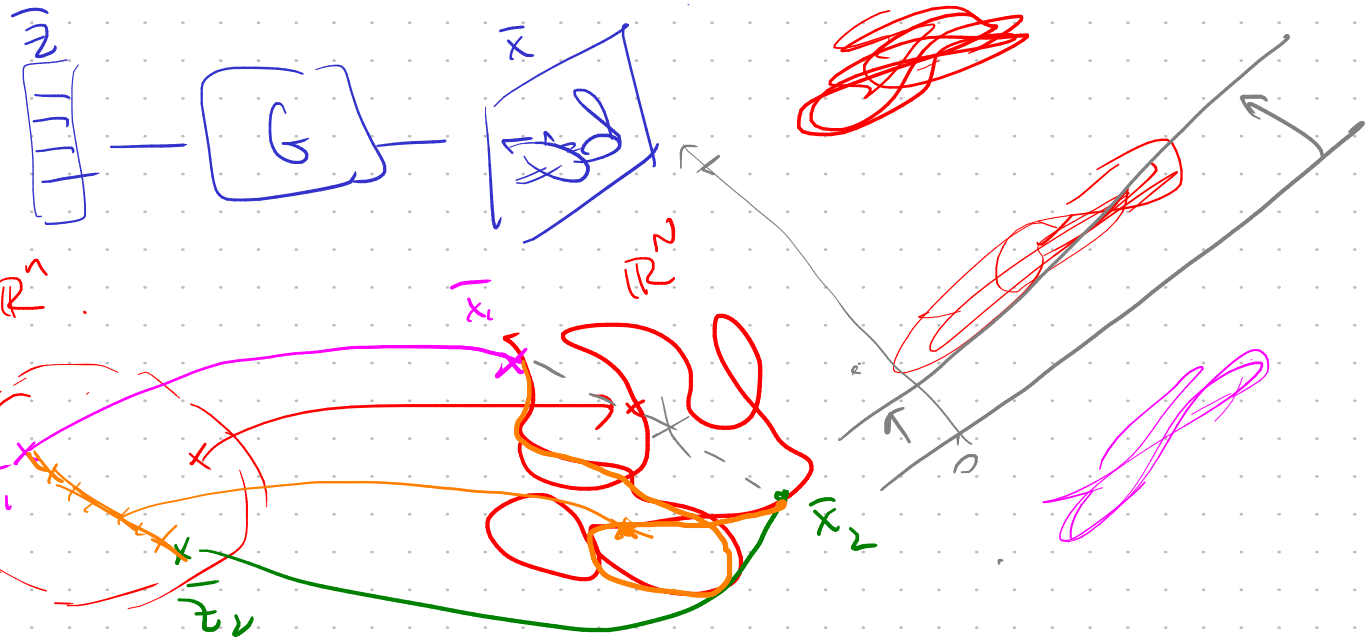
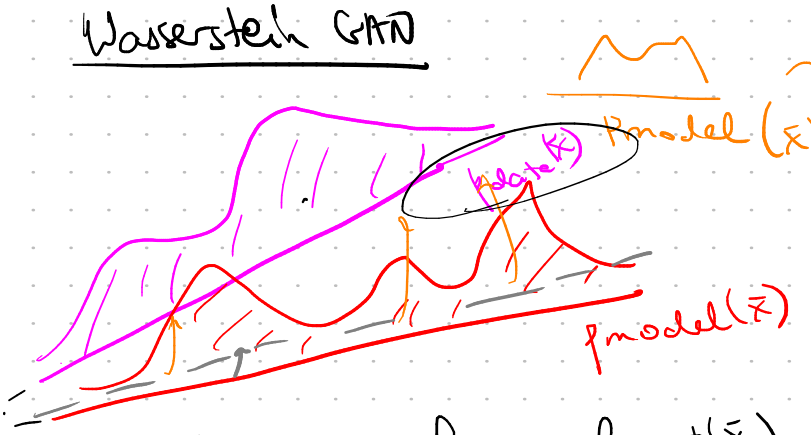
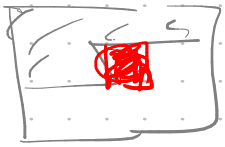


Wasserstein GAN



$p_{model}(\bar{x}) \approx p_{data}(\bar{x})$

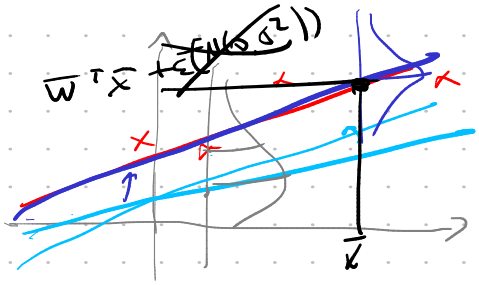
$KL(p_{data} \| p_{model}) \to \min$

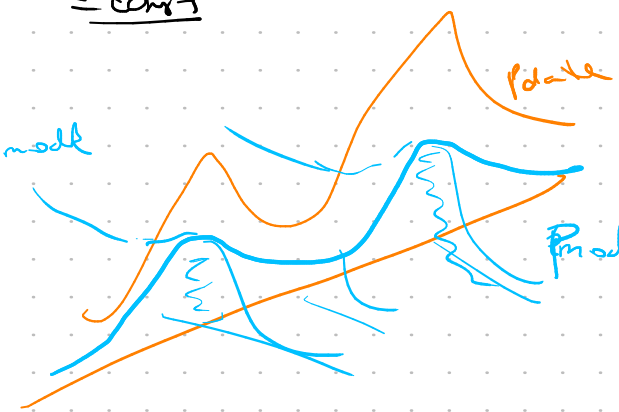


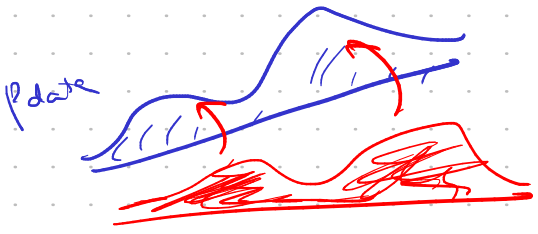
$$KL(p\|q) = \int p(\bar{x}) \log \frac{p(\bar{x})}{q(\bar{x})} d\bar{x} = \infty$$

$KL(q\|p) = \infty$ $\quad JSD(p\|q) = KL\left(p \,\|\, \frac{p+q}{2}\right) + KL\left(q \,\|\, \frac{p+q}{2}\right)$

$= \text{const}$







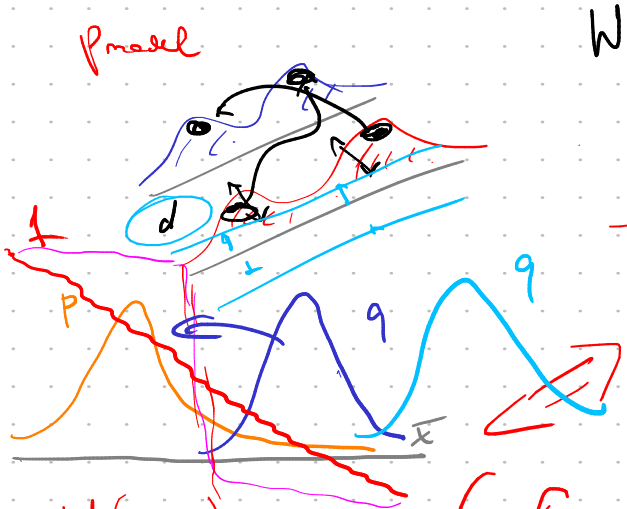
Earth Mover Distance EMD

Wasserstein distance

$$W(p,q) = \inf_{\gamma \in Prob(p,q);\ \int \gamma(\bar{x},\bar{y})\,d\bar{x} = q(\bar{y}),\ \int \gamma(\bar{x},\bar{y})\,d\bar{y} = p(\bar{x})} \left[E_{\gamma(\bar{x},\bar{y})} \left[\|\bar{x} - \bar{y}\|^2 \right] \right]$$

Двойств. Монжа - Канторовича

Kantorovich - Rubinstein duality



$$W(p,q) = \sup_{f:\|f\|_L \le 1} \left(E_{p(\bar{x})}[f(\bar{x})] - E_{q(\bar{x})}[f(\bar{x})] \right)$$

pdata

$p_{model}(\bar{x}) = p_\theta(G(\bar{z}))$

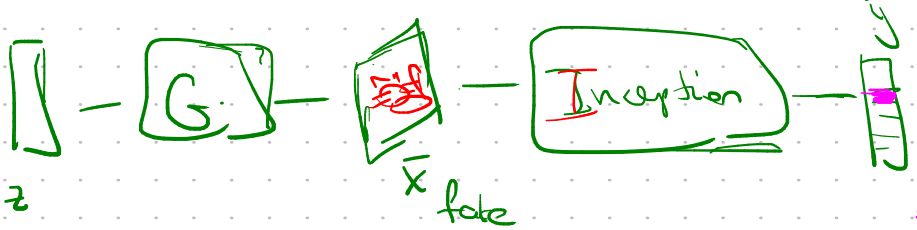
- fix G, θ

$$E_b[f] - E_{G(\bar{z})}[f] \xrightarrow[\bar{w}]{} \max$$

- fix $\bar{w}, f$

$$- E_{G(\bar{z})}[f] \xrightarrow[\theta]{} \min$$

Inception score



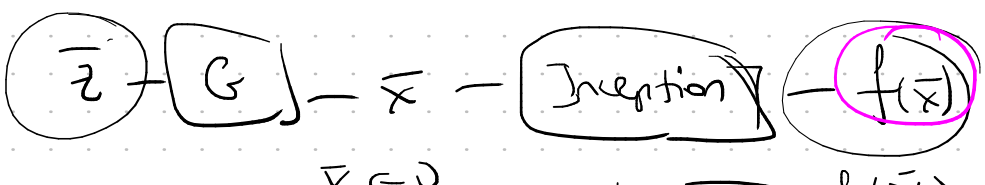
$p(y|\bar{x})$ - маленькая энтропия

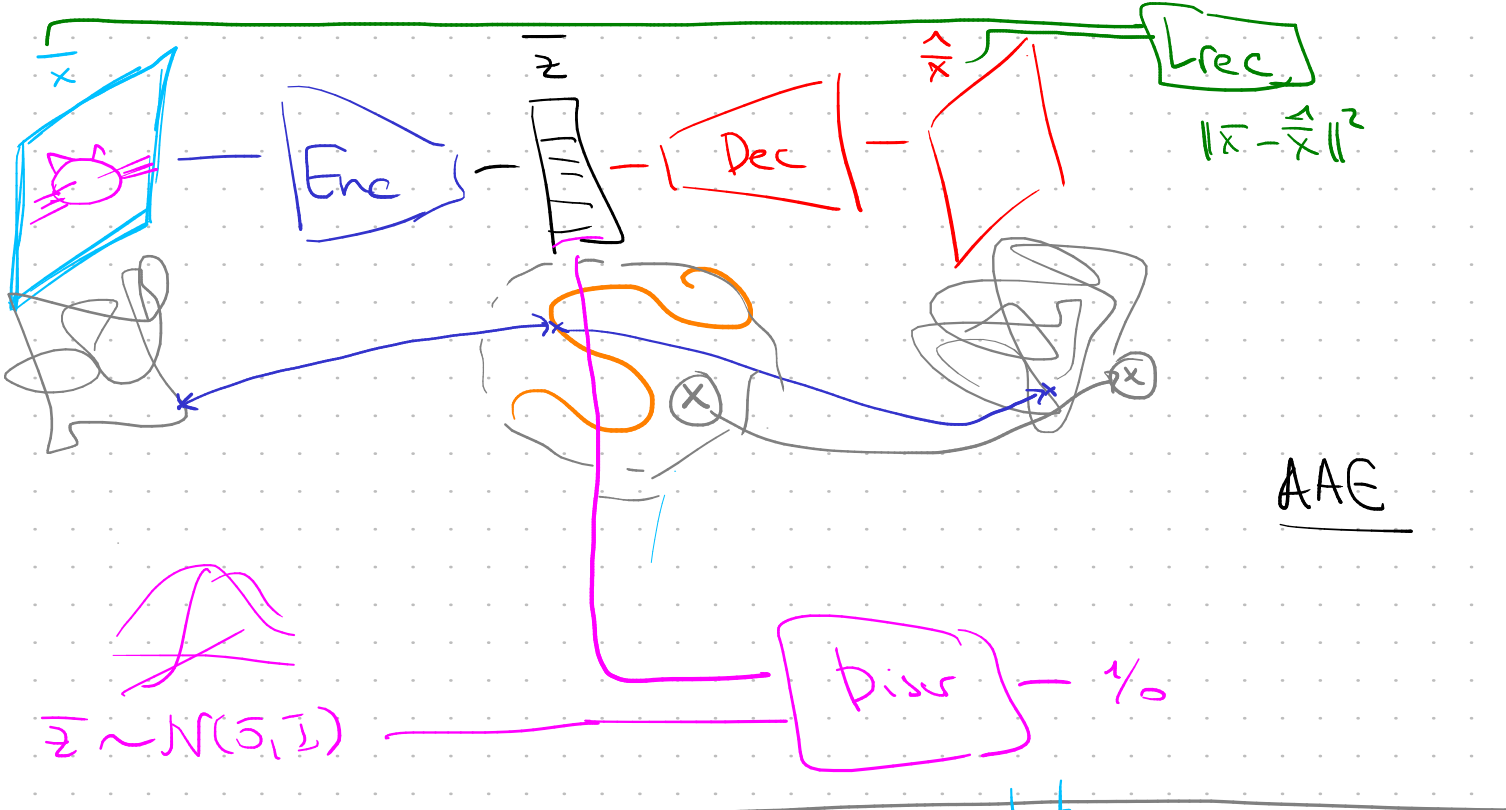
$p(y)$ - большая энтропия

$$IncScore = E_{\bar{x}}\left[KL(p(y) \| p(y|\bar{x})) \right]$$

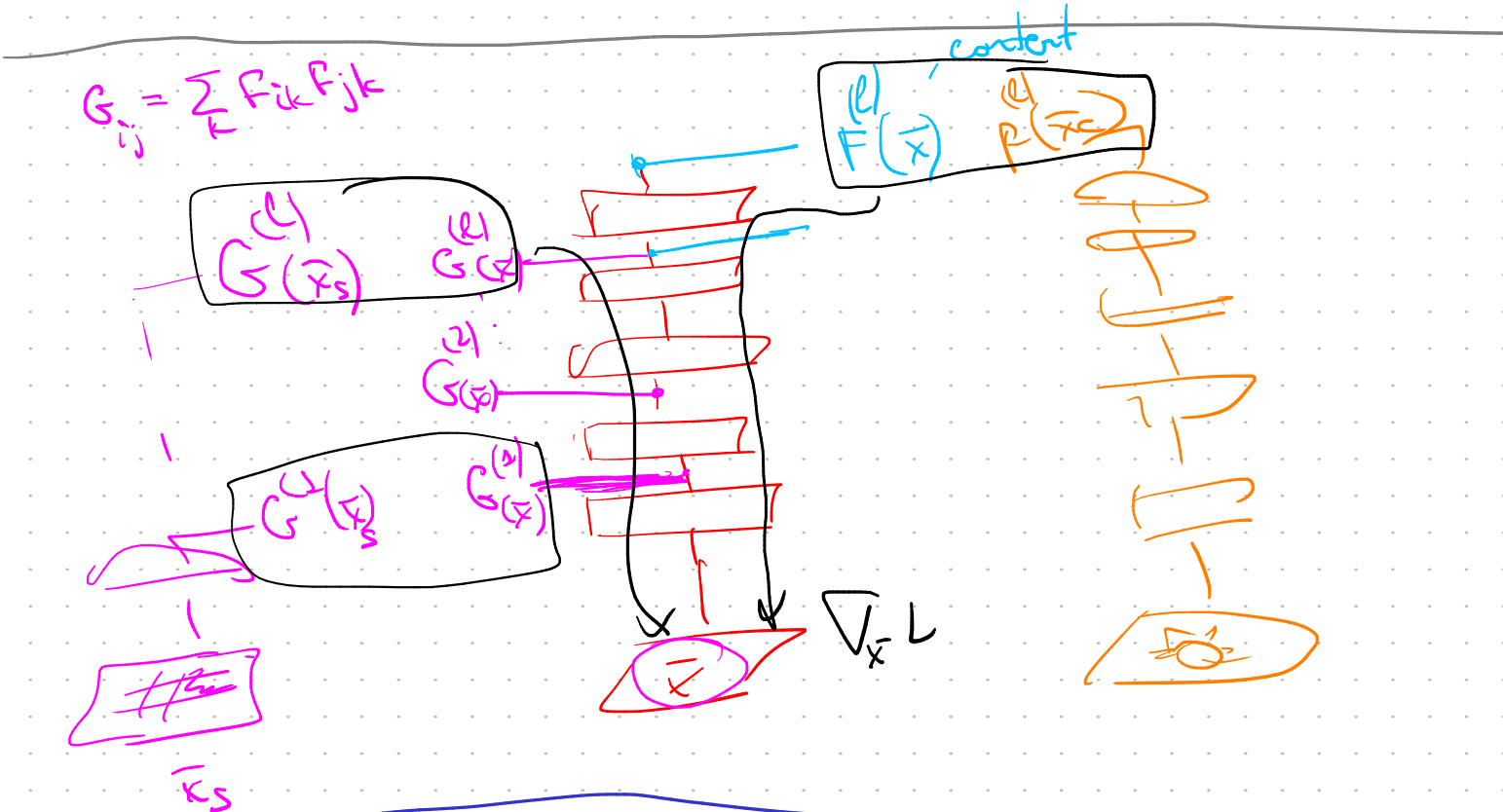
FID - frechet Inception Distance

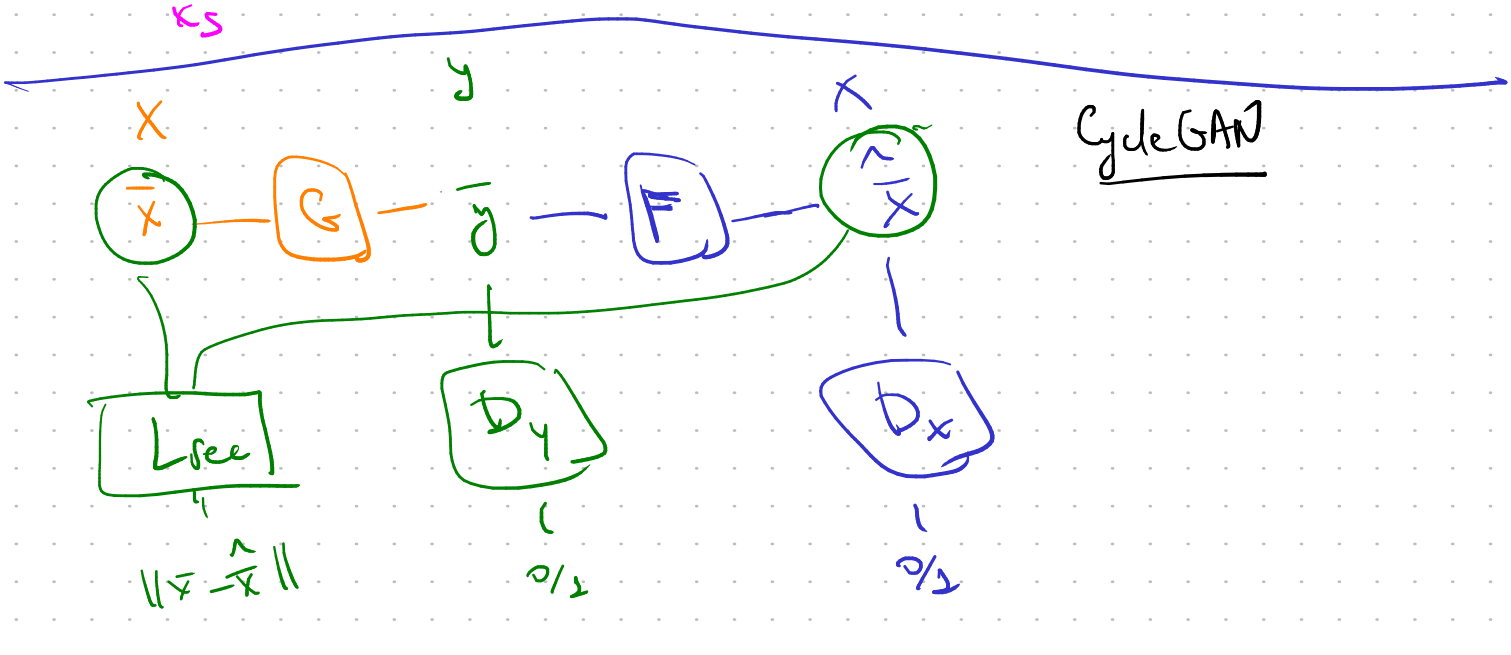
$$d\left(p_{feat}(G(\bar{z})),\ p_{feat}(\bar{x}) \right)$$





AAE





CycleGAN