14.12.21

BLG 561 E   FALL 2021

Deep Learning / GANs : this week
                      we went through
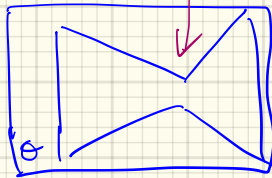   slides mainly.

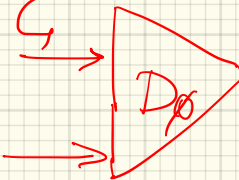Gözde ÜNAL

Denoising GAN : → a Conditional GAN.

$G(X)$ denoised

Clean Image original

ep. CelebA dataset $i = 1, ..N$

X → $x + u = \tilde{x}$ → add noise → **Generator (AE)** → $G_\theta(\tilde{x})$: Denoised image

$G_\theta(\tilde{x})$

* **Generator uses Reconstruction loss.**

① $(x, G_\theta(\tilde{x}))$ + $\mathcal{L}_{reconstruction}$

② BCE Loss :

$G_\theta(\tilde{x})$ → D_ϕ → Denoised image (0) or Original Image. (1) (clean)

$\times$ →

$\log D_\phi(x) - \log D_\phi(G_\theta(\tilde{x}))$

$\mathcal{L}_{overall}$ loss $=$

$\mathcal{L}_{BCE}$

$\|x - G(\tilde{x})\|_2^2$

Training Time : Train G & D networks
Test time : Use feedforward Generator to produce denoised version of the input image.

StyleGAN $\longrightarrow$ look at the paper itself.

[Karras et al 2019]
"A Style-Based Generator Architecture
for GANs".