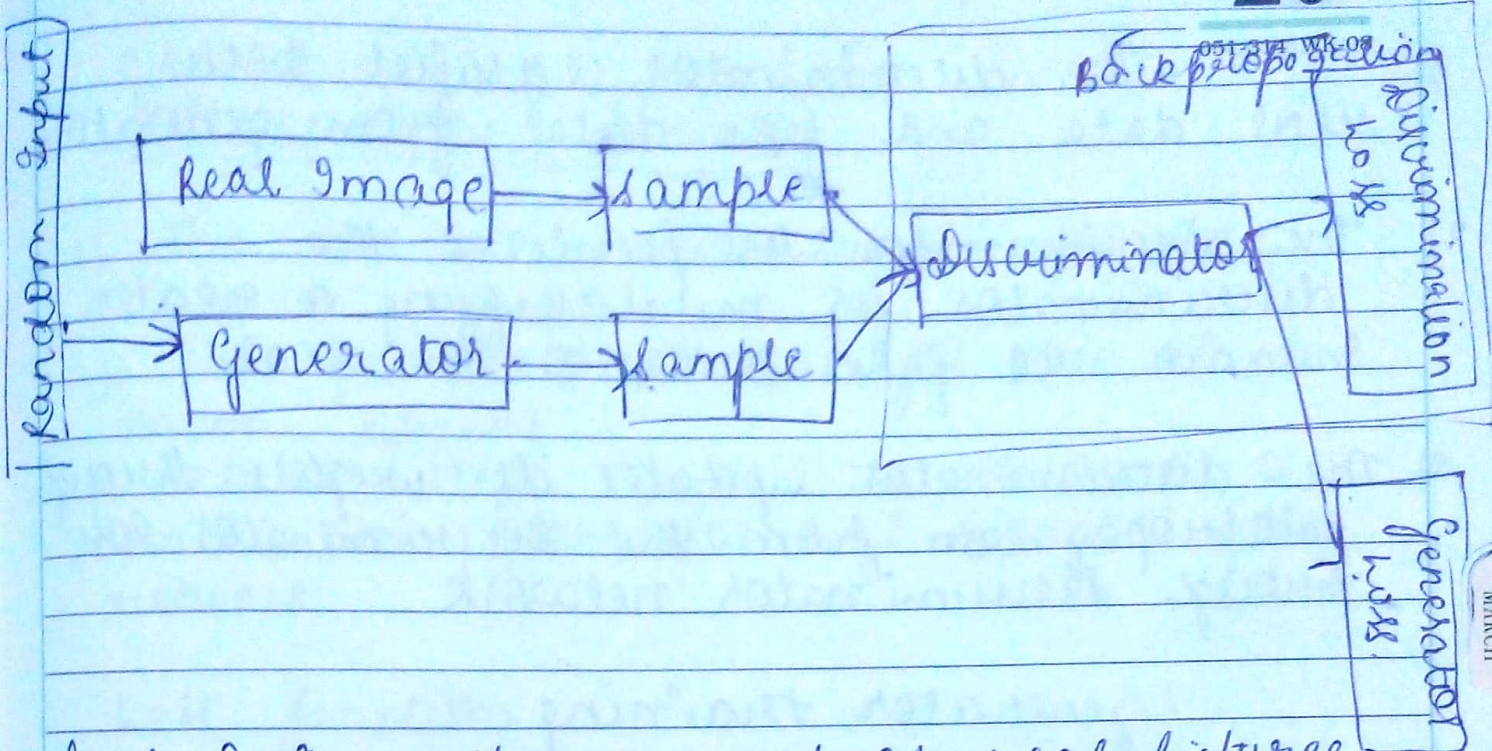


GANs (Generative Adversarial Networks)



Real Data instances, such as real pictures, discriminator uses these instances as positive examples during training

fake Data, created by generator. The discriminator uses ~~this~~ these instances as negative examples during training.

Discriminator connects to two functions. During discriminator training, the discriminator ignores the generator loss and just uses the discriminator loss. We use generator loss during generator training.

March 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31								

People who see the beauty in those around them, make beautiful things happen.

WEDNESDAY

FEB '18

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During Discriminator training

- 1) The discriminator classifies both real data and fake data from generator.
- 2) The discriminator loss penalizes the discriminator for misclassifying a real instance as fake instance as real.
- 3) The discriminator updates its weights through backpropagation from the discriminator loss through discriminator network.

Generator training

Using Discriminator to train the Generator

- 1) Sample random noise.
- 2) Produce generator output from sampled random noise.
- 3) Get discriminator 'real' or 'fake' classification for generator output.
- 4) Calculate loss from discriminator classification.
- 5) Backpropagate through both discriminator and generator to obtain gradients.

February 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
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19	20	21	22	23	24	25	26	27	28											

21-02

Relationships based on the falsehood are like houses built with their foundations of mud.

1) Use gradients to change only generator weights

GAN training proceeds in alternating periods

- 1) The discriminator trains for one or more epochs
- 2) The generator trains for one or more epochs
- 3) Repeat steps 1 and 2 to continue to train the generator and discriminator network

loss function

Minimax Loss - In the paper that introduced GANs, the generator tries to minimize the following function and discriminator tries to maximize it

$$E_x[\log(D(x))] + E_z[\log(1 - D(G(z)))]$$

$D(x)$ - Discriminator's estimate of probability that real instance x is real.

E_x - Expected value all over the real data instances

$G(z)$ - is the generator's output when given noise z .

March 2018

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We may recover from slip of the foot but a slip of tongue leaves a deep imprint

FRIDAY

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$D(G(z))$ is the discriminator's estimate of the probability that a fake instance is real.

E_z is the expected value over all random inputs to the generator (in effect, the expected value over all generated fake instances $G(z)$)

Wasserstein loss ~~with~~

The discriminator does not classify instance, for each instance it outputs a number. This number does not have to be less than or greater than 0, so we can't use 0.5 as a threshold to decide whether threshold is real instance or fake. WGAN discriminator is actually a 'critic' instead of 'discriminator'.

Critic loss: $D(z) - D(G(z))$ (The discriminator tries to maximize it)

Generator loss: $D(G(z))$

The generator tries to maximize the J_G .

February 2018

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When you dream, you will discover who you are and what you can do.

$D(z)$ - Critic's output for a real instance.

SATURDAY

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$G(z)$ is generator's output for given noise z .

$D(G(z))$ - is critic's output for fake instance.

The output of Critic D does not have to b/w 1 and 0.

March 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
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Your conscience is a good friend, listen to it more often.

24-02