

# Outline

- Anime Dataset
  - GAN
  - WGAN-GP
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# Anime



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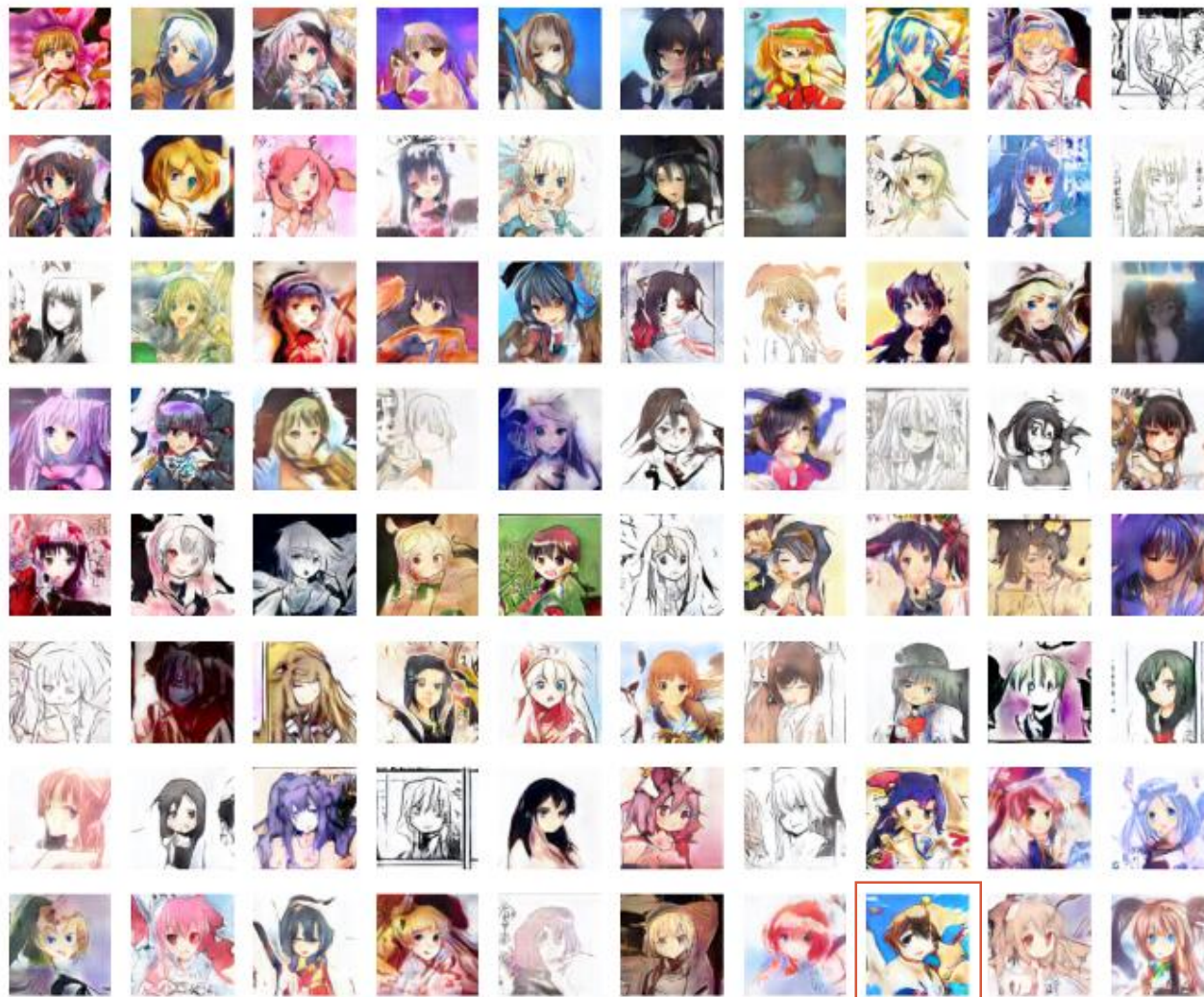
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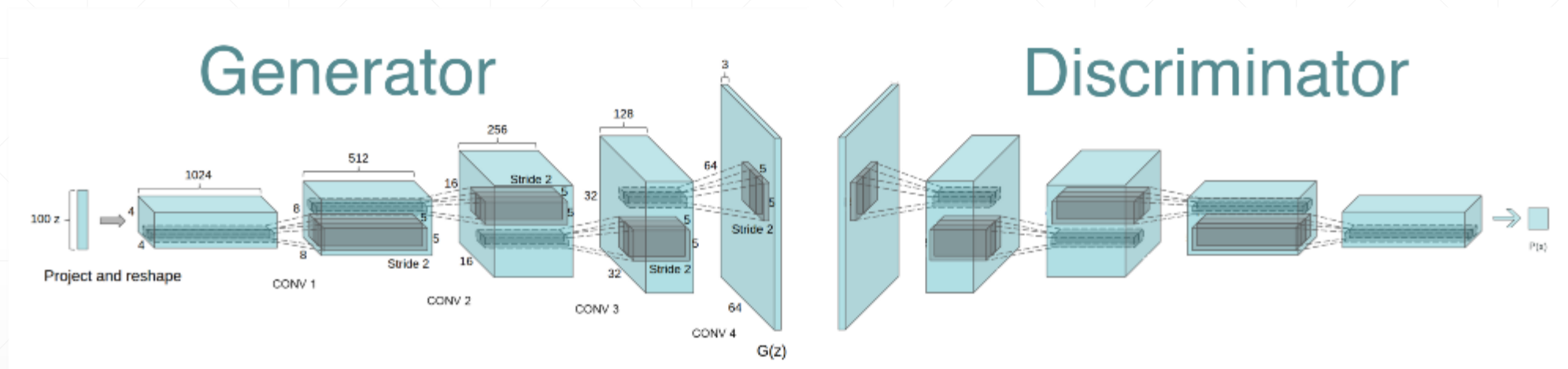
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# Download

- dataset link: <https://pan.baidu.com/s/1eSifHcA>,
  - 提取码: g5qa
  - ~280MB
-

# GAN



# WGAN-GP

$$L = \underbrace{\mathbb{E}_{\tilde{\mathbf{x}} \sim \mathbb{P}_g} [D(\tilde{\mathbf{x}})] - \mathbb{E}_{\mathbf{x} \sim \mathbb{P}_r} [D(\mathbf{x})]}_{\text{Original critic loss}} + \lambda \underbrace{\mathbb{E}_{\hat{\mathbf{x}} \sim \mathbb{P}_{\hat{\mathbf{x}}}} [(\|\nabla_{\hat{\mathbf{x}}} D(\hat{\mathbf{x}})\|_2 - 1)^2]}_{\text{Our gradient penalty}} .$$

*where  $\hat{\mathbf{x}}$  sampled from  $\tilde{\mathbf{x}}$  and  $\mathbf{x}$  with  $t$  uniformly sampled between 0 and 1*

$$\hat{\mathbf{x}} = t\tilde{\mathbf{x}} + (1 - t)\mathbf{x} \text{ with } 0 \leq t \leq 1$$

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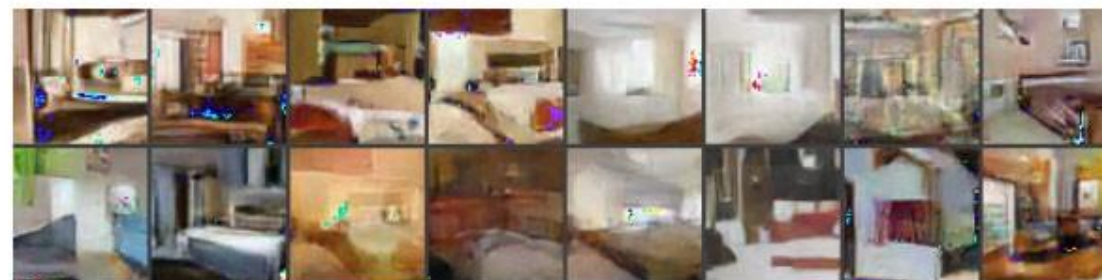
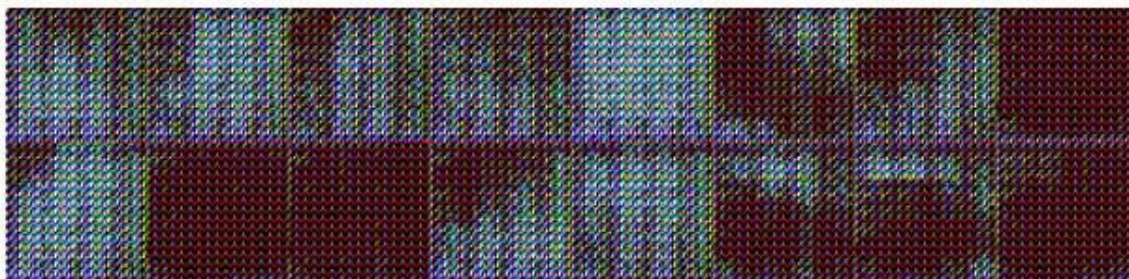
**WGAN with DCGAN generator**



**GAN with DCGAN generator**



**Without batch normalization &  
constant number of filters at each layer**



**Using a MLP as the generator**



**All critics and discriminators follow the same discriminator design in DCGAN**