

Conditional Generation by GAN

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Text-to-Image

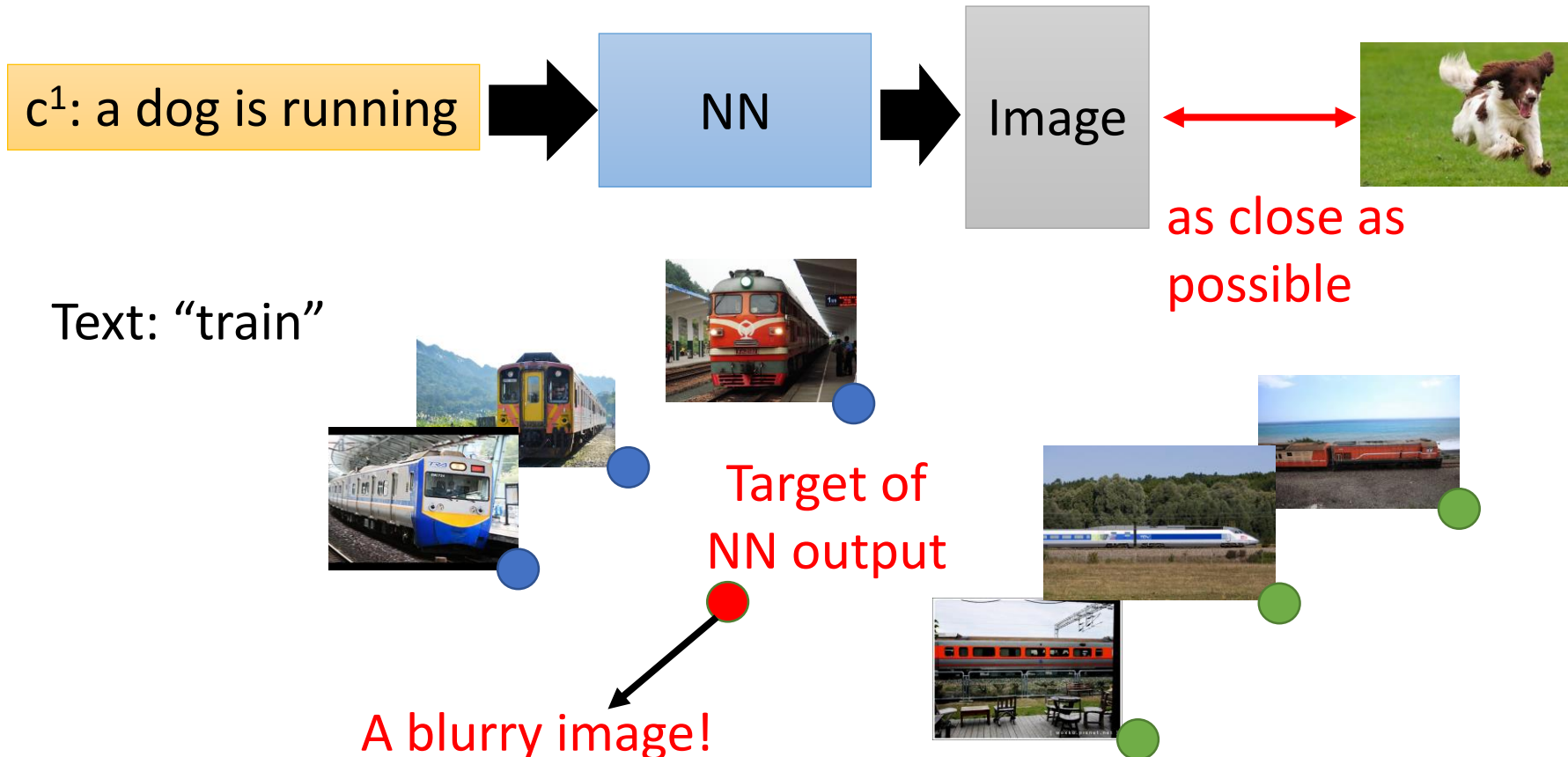
a dog is running



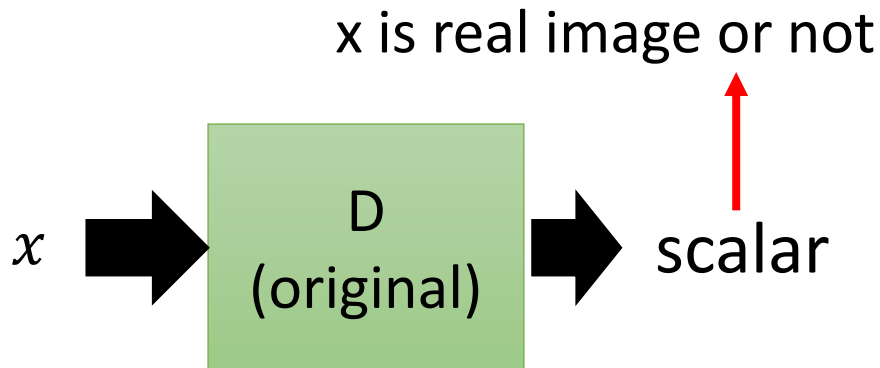
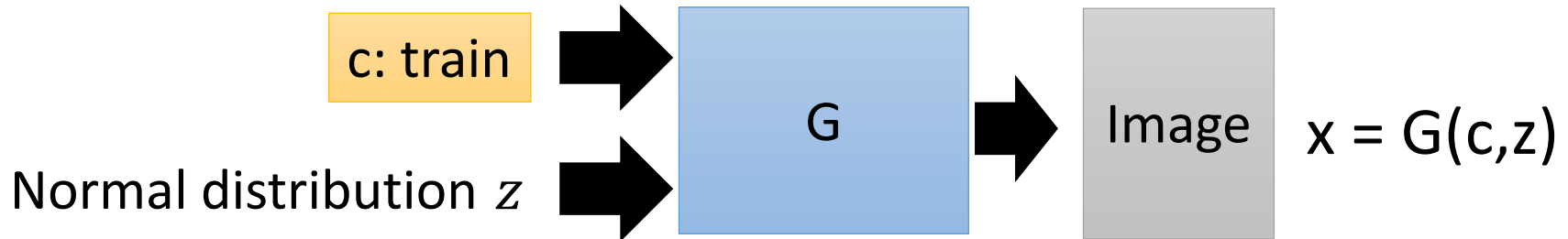
a bird is flying



- **Traditional supervised approach**

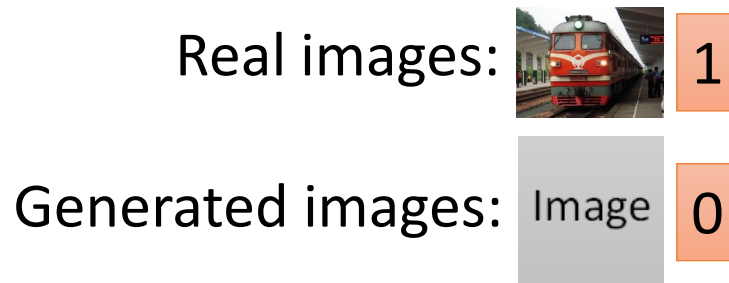


Conditional GAN

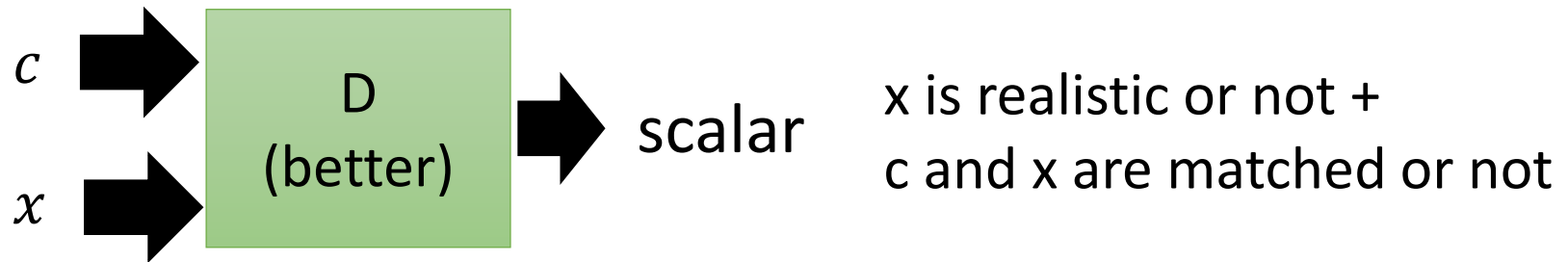
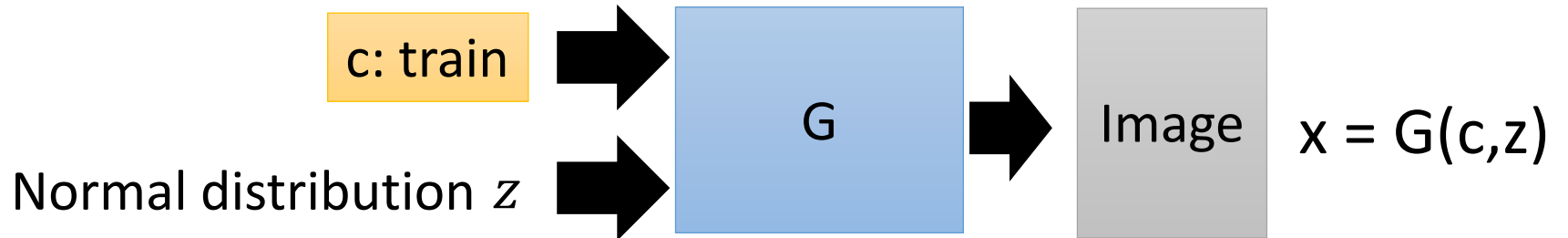


Generator will learn to generate realistic images



But completely ignore the input conditions.



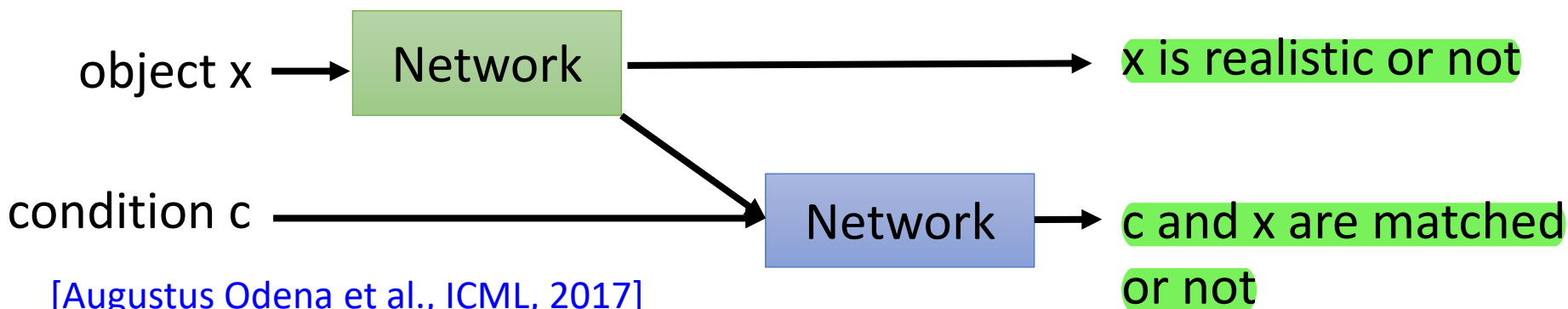
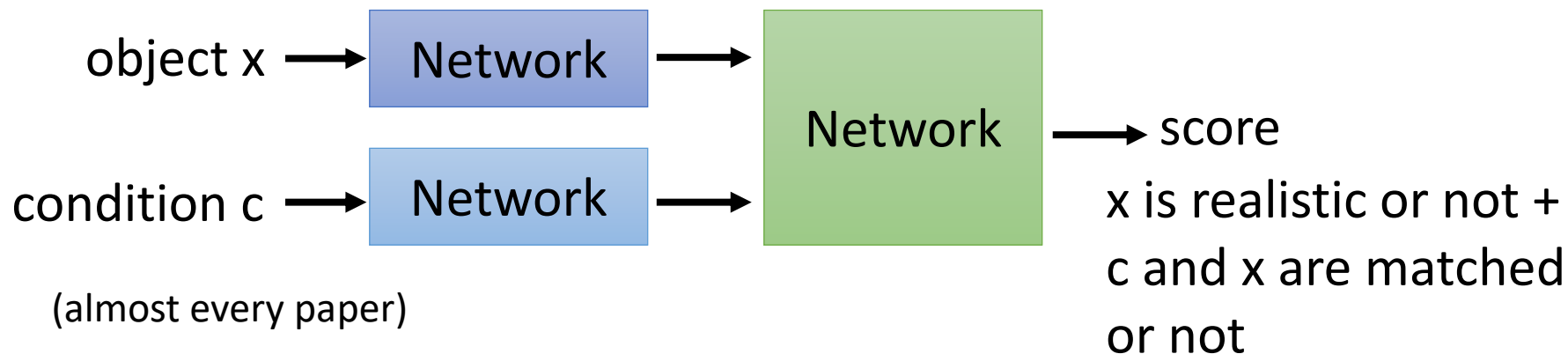
Conditional GAN



True text-image pairs: (train , ) 1

(cat , ) 0 (train , ) 0

Conditional GAN - Discriminator



[Augustus Odena et al., ICML, 2017]

[Takeru Miyato, et al., ICLR, 2018]

[Han Zhang, et al., arXiv, 2017]

Conditional GAN

The images are generated by
Yen-Hao Chen, Po-Chun Chien,
Jun-Chen Xie, Tsung-Han Wu.

paired data



blue eyes
red hair
short hair

Collecting anime faces
and the description of its
characteristics

red hair,
green eyes



blue hair,
red eyes



Stack GAN

Han Zhang, Tao Xu, Hongsheng Li, Shaoting Zhang, Xiaogang Wang, Xiaolei Huang, Dimitris Metaxas, "StackGAN: Text to Photo-realistic Image Synthesis with Stacked Generative Adversarial Networks", ICCV, 2017

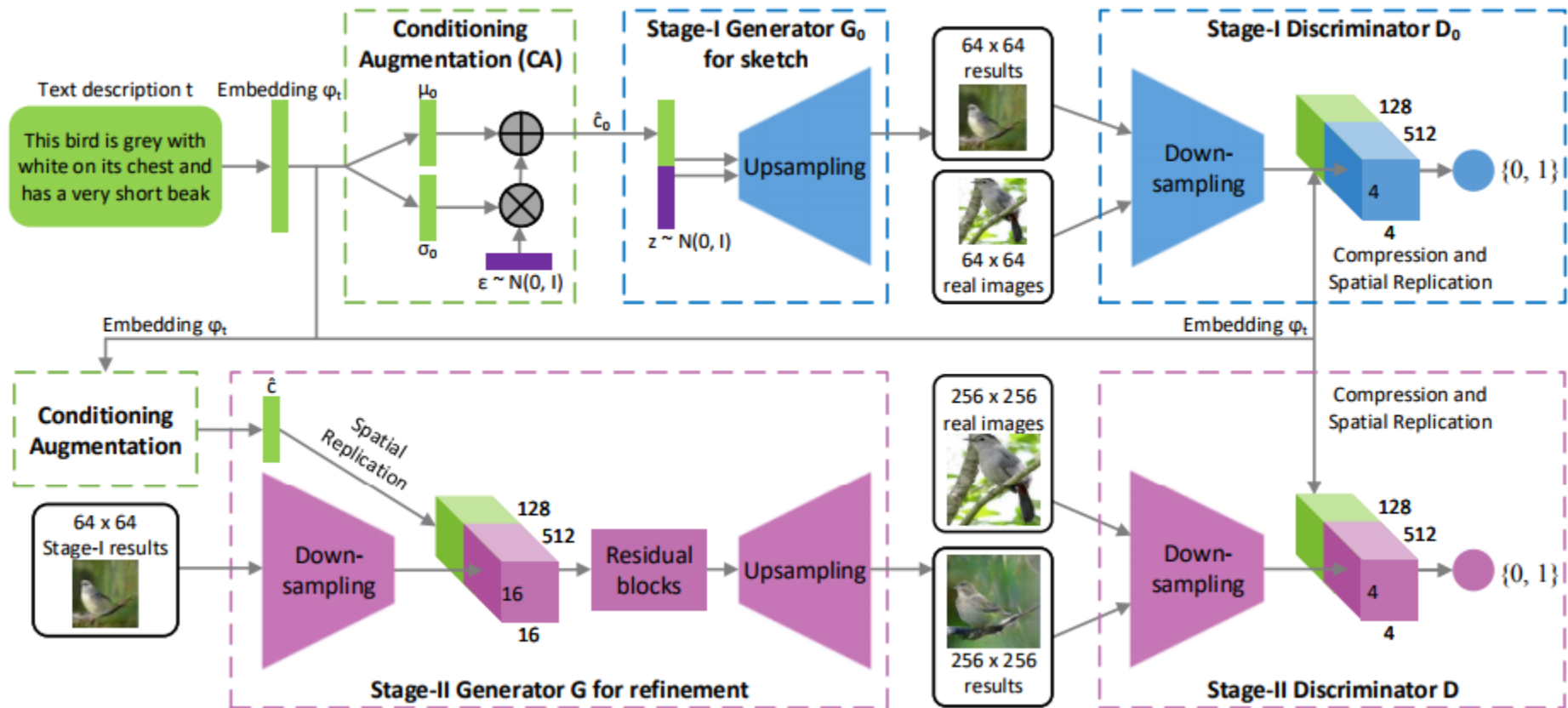
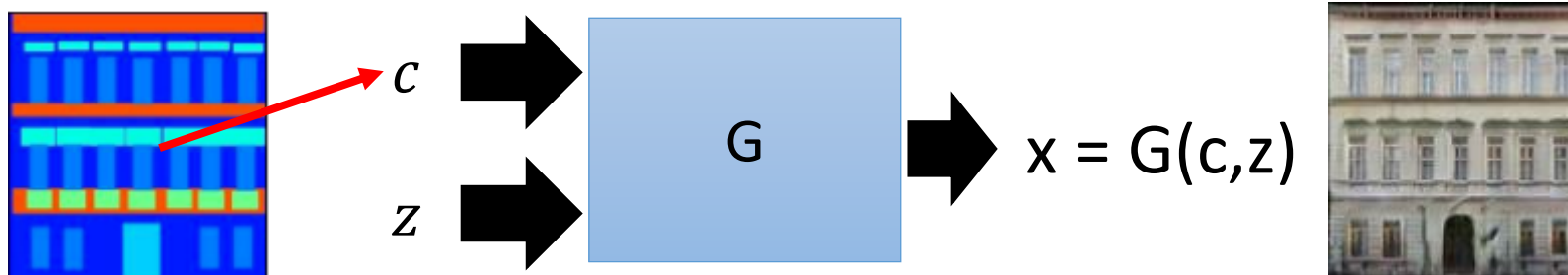


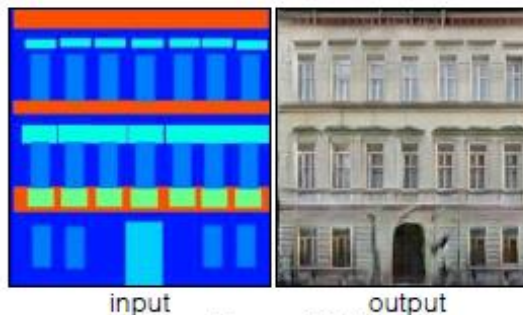
Image-to-image



Labels to Street Scene



Labels to Facade



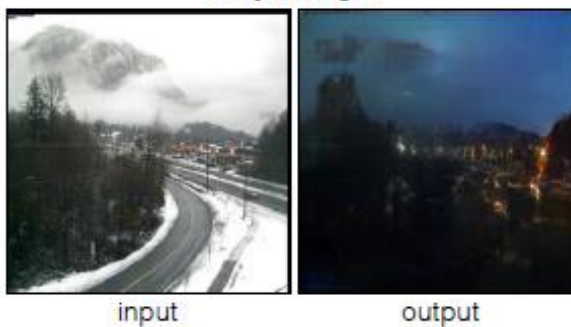
BW to Color



Aerial to Map



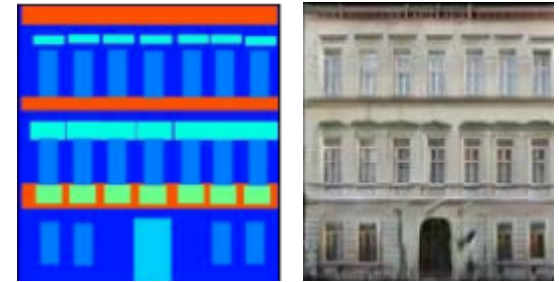
Day to Night



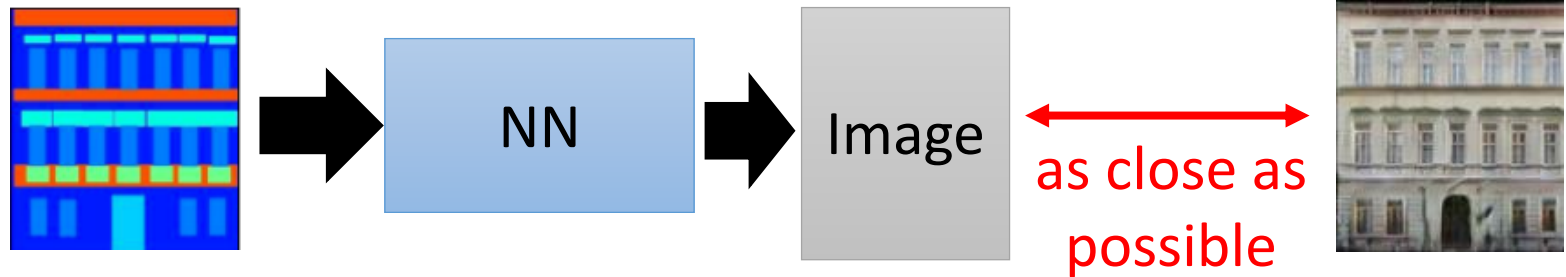
Edges to Photo



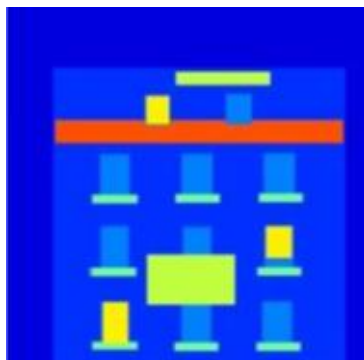
Image-to-image



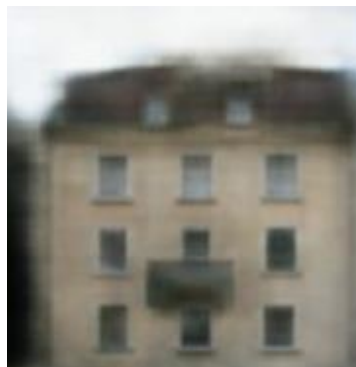
- Traditional supervised approach



Testing:



input

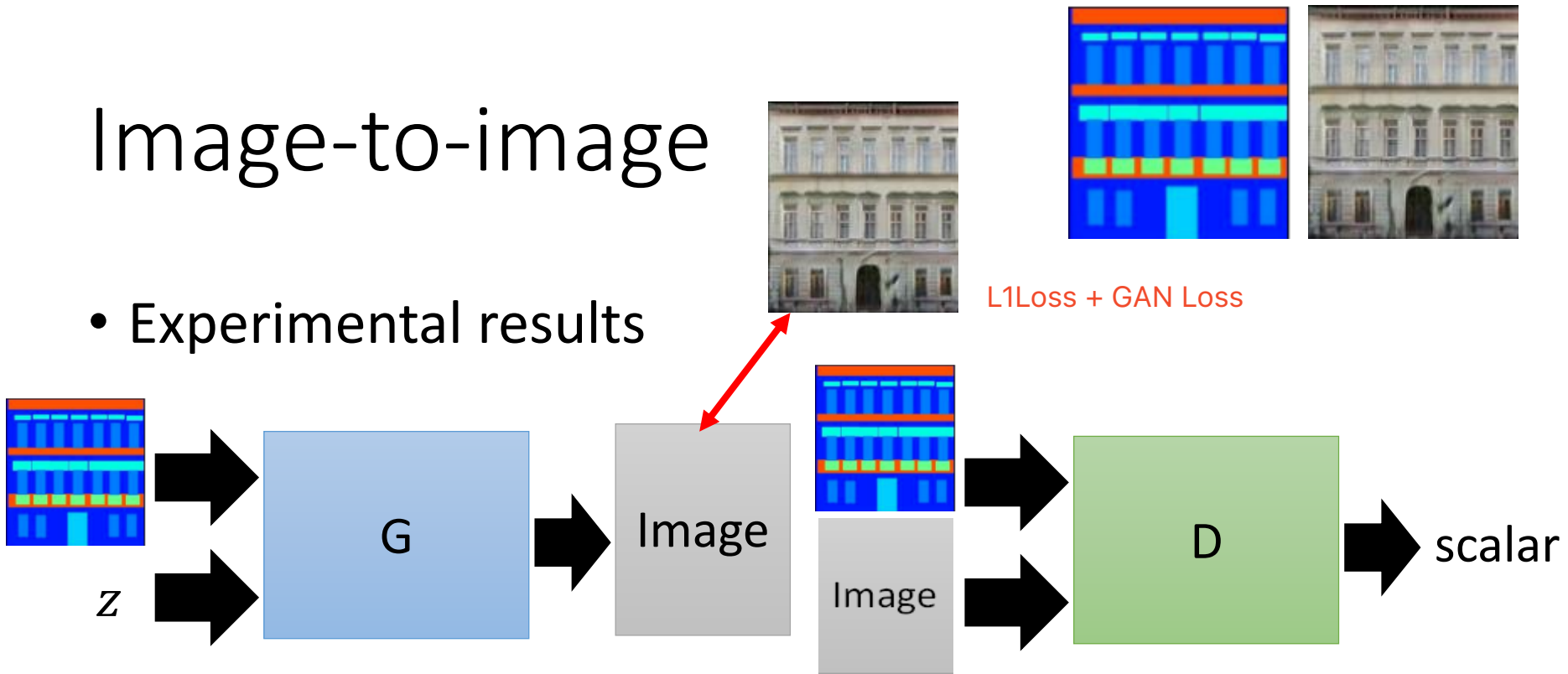


close

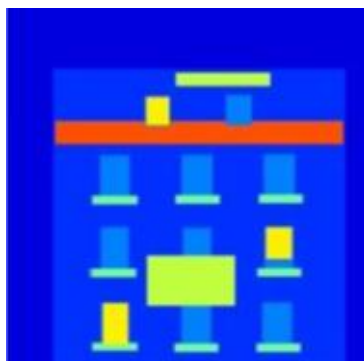
It is blurry because it is the average of several images.

Image-to-image

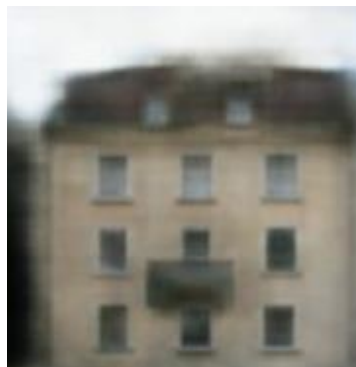
- Experimental results



Testing:



input



close



GAN

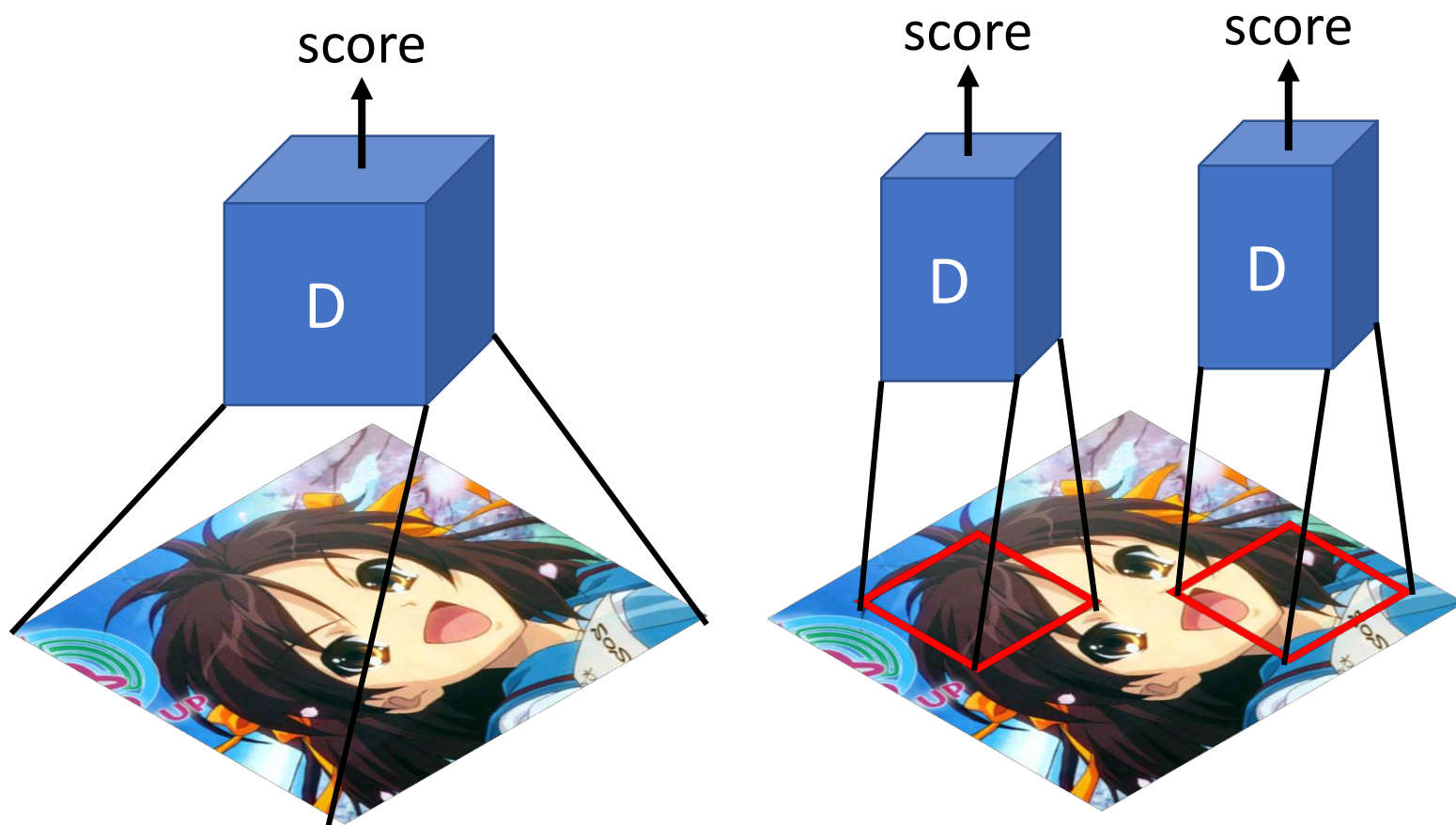


GAN + close

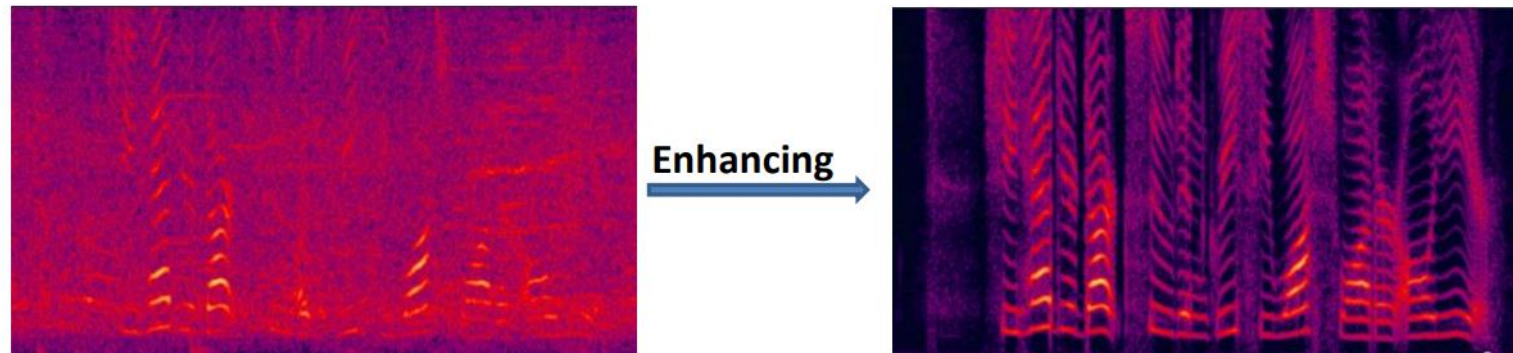
Patch GAN

Patch GAN 专注于局部区域的判别

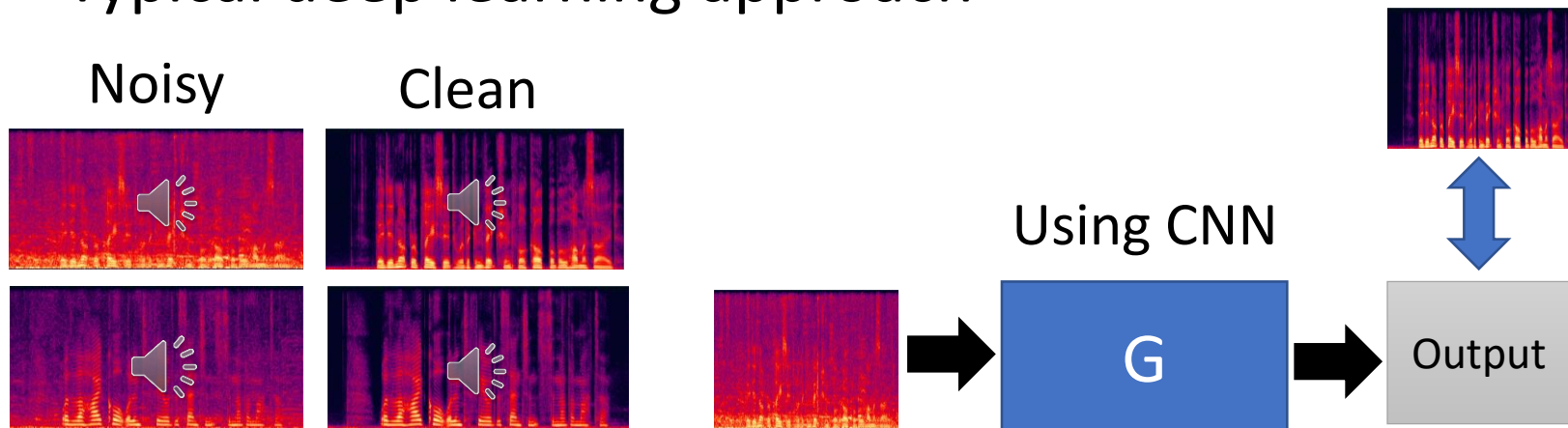
<https://arxiv.org/pdf/1611.07004.pdf>



Speech Enhancement

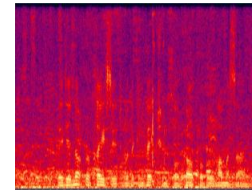


- Typical deep learning approach

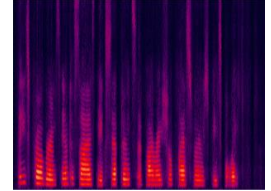


Speech Enhancement

training data

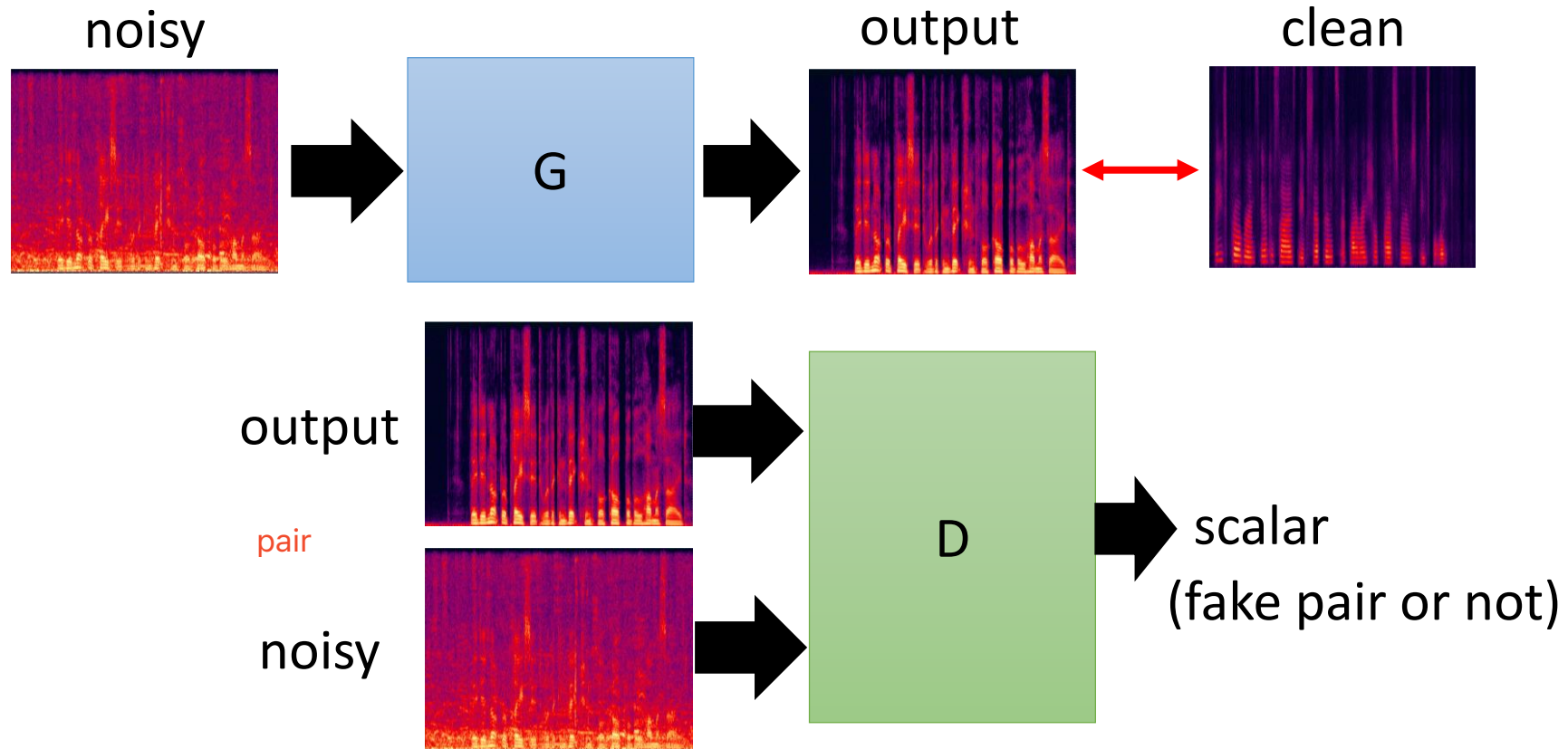


noisy

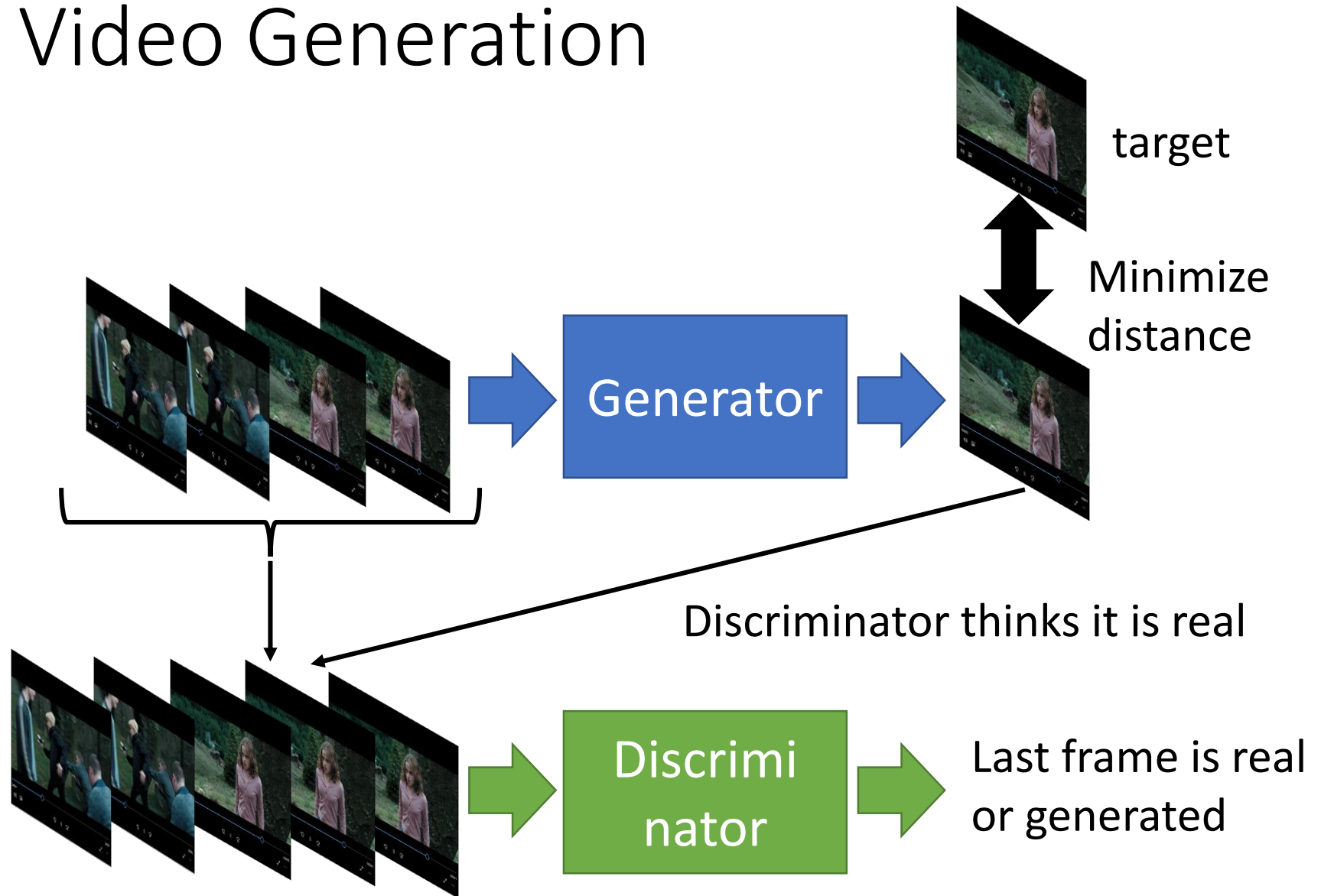


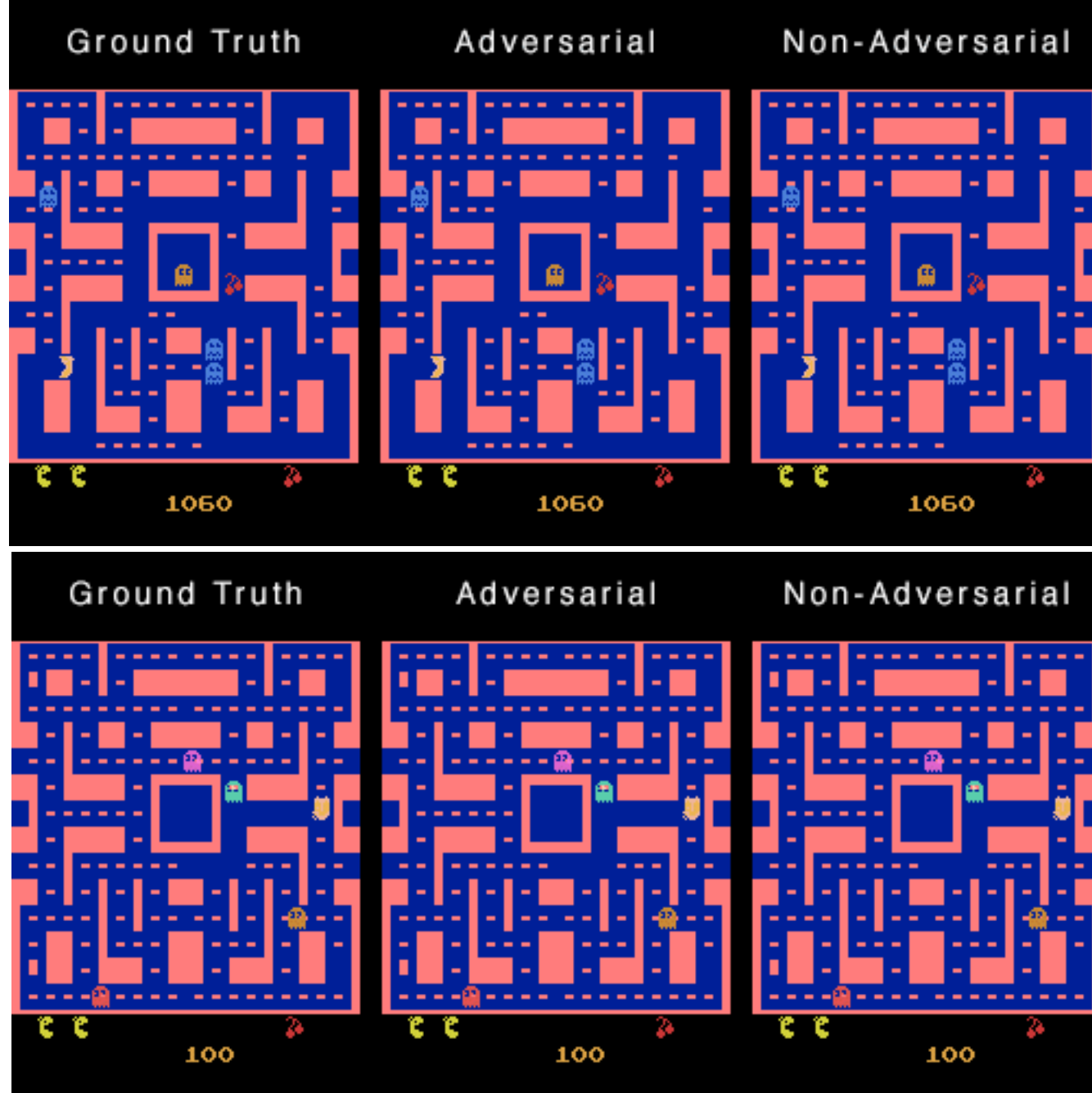
clean

- Conditional GAN



Video Generation





https://github.com/dyelax/Adversarial_Video_Generation