

Application Theory In Practice

Generative Adversarial Networks Deep Learning — Unit 9

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Outline

Applications

2 Essential Theory



Outline

Applications

2 Essential Theory



1 Applications

2 Essential Theory



Outline

Applications

2 Essential Theory





Applications

GANs

Goodfellow et al. (2014)









d)



Applications

Theory

In Practic

DCGANs

Radford et al. (2016)



(a) Generated by LSGANs.



(b) Generated by DCGANs (Reported in [13]).

Figure 5: Generated images on LSUN-bedroom.



Applications

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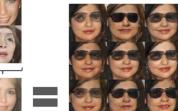
In Practic

DCGANs Radford et al. (2016)











man with glasses



man without glasses



woman without glasses

woman with glasses















Results of doing the same arithmetic in pixel space

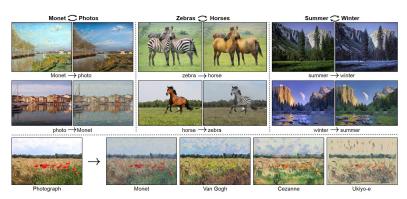


Applications

Theory

In Practic

CycleGANs Zhu et al. (2017)



https://junyanz.github.io/CycleGAN

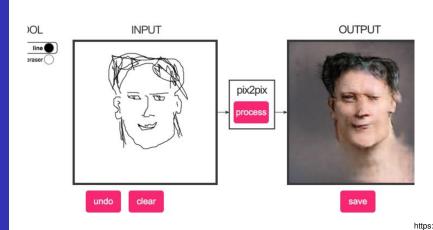


Applications

Theory

In Departie

pix2pix Isola et al. (2017)





Applications

Theory

In Practic

StackGAN Zhang et al. (2017)



Figure 3. Example results by our proposed StackGAN, GAWWN [20], and GAN-INT-CLS [22] conditioned on text descriptions from CUB test set. GAWWN and GAN-INT-CLS generate 16 images for each text description, respectively. We select the best one for each of them to compare with our StackGAN.



Applications

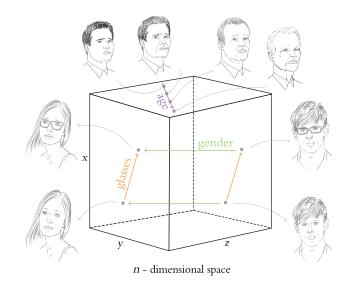
Theory

In Practic

[Which Face is Real?]



Applications
Theory



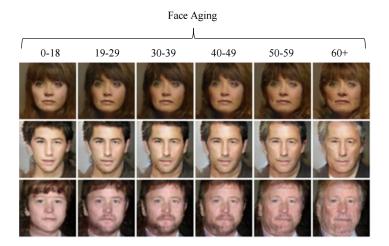
["celebrity" latent-space interpolation]
[Mona Lisa frown]



Applications

Theory

Latent-Space Interpolation



[Ganvatar interactive demo]



- [make \$ selling art :)]
- increase the resolution of an image
- simulate data, e.g., for training autonomous vehicles
- predict next frames of video
- speed fashion/architectural design (sketches to photorealism)
- edit images with realistic, nuanced changes
- [artificial intelligence augmentation (AIA)]
- also can generate time series like text, prices, audio



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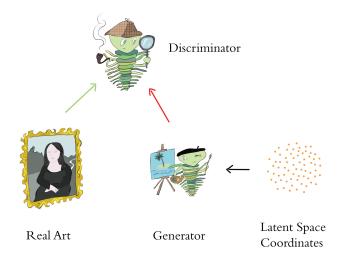
Outline

Applications

2 Essential Theory



Applications
Theory





Applications

Theory

In Practice

GENERATOR

Z

DISCRIMINATOR





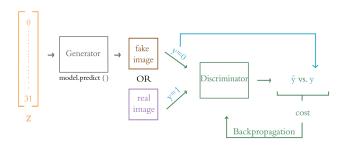


Applications

Theory

In Practice

TRAINING THE DISCRIMINATOR





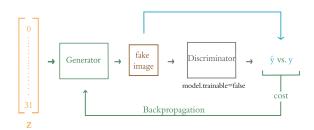


Applications

Theory

In Practice

TRAINING THE GENERATOR





Applications

Theory

In Practic

1-D Gaussian

Approximating a Toy Distribution

[video]



Outline

Applications

2 Essential Theory



Applications

Theory

In Practice

[Quick, Draw!]



Applications

Eboory

In Practice

GANimation

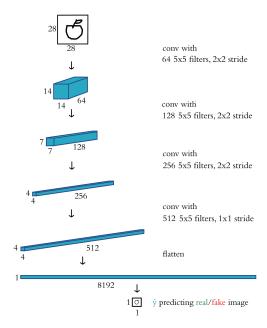
(Requires Adobe Acrobat Reader)



Applications

Theory

In Practice

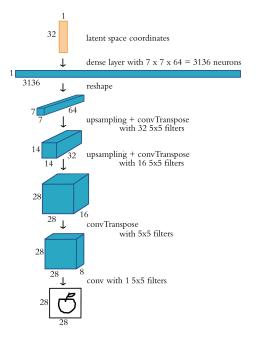




Application:

Theory

In Practice





Applications

Theory

In Practice

GAN Code

[notebook]

