Introduction to GANs

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Previously

Image Classifier

64 x 64 x 3

16 kernels

16

16

32

2

Dog
Previously

Image Generator

Conv1  Conv2  Conv3  Conv4  Deconv1  Deconv2  Deconv3

Encoder  Decoder
Generative Adversarial Networks

Image Generator

Array of random numbers

Image Classifier

Dog?
Generative Adversarial Networks
Conditional Generative Adversarial Networks
Conditional Generative Adversarial Networks

Generator

Real

Or

Fake

Discriminator

True or False
GAN basics

Each image is 64x64 pixels = 4096 pixels

3 channels RGB; 4096 * 3 = 12,288 pixels

Each pixel is one dimension

A single point in this distribution corresponds to a vector of 12,228 pixels which can be reshaped to 64x64x3

This is a complex distribution and properties are unknown to us

Distribution of human face images

~12K dimensions
GAN basics

F(Gaussian noise) = point in the face image distribution space (P)
F(P) = true or false
F(Gaussian noise) is the generator
F(P) is the discriminator

Gaussian Distribution
Simple and well-studied distribution
GAN Denoising
GAN Denoising
GAN Denoising

Generator
GAN Denoising
Deep Illumination - indirect illumination with GANs
Deep Illumination - indirect illumination with GANs

Training set

Test set
Deep Illumination - indirect illumination with GANs
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