Part 5/6: Improvement Techniques

DCGAN (2015)

Deep Convolutional GAN

Architecture Overview

Generator

z (Noise)

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Project & Reshape

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Fractional-Strided Conv

Batch Norm + ReLU

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Fractional-Strided Conv

Batch Norm + ReLU

↓

Fractional-Strided Conv

Batch Norm + ReLU

Discriminator

Image

↓

Strided Conv

LeakyReLU

↓

Strided Conv

Batch Norm + LeakyReLU

↓

Strided Conv

Batch Norm + LeakyReLU

↓

Strided Conv

Architecture Guidelines

Generator

Fractional-strided conv + ReLU (tanh output)

Discriminator

Strided conv + LeakyReLU

Normalization

Batch norm (except G output, D input)

✓ Benefits

- ★ Stable training
- ★ Higher resolutions
- ★ Better image quality
- ★ Foundation for future GANs

Key Features

- ✓ Replace fully connected layers with convolutions
- ✓ No pooling layers - use strided convolutions
- ✓ Batch normalization in both G and D

Original Paper

Unsupervised Representation Learning with Deep Convolutional Generative Adversarial Networks

Radford et al., 2015