Precomputed Real-Time Texture Synthesis with Markovian Generative Adversarial Networks

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Deep Texture Synthesis


~20 seconds for a 512 x 512 image with a Titan X card
Deep Texture Synthesis

Input Texture
Style Image: Monet, Boats in The Port

25 Hz for a 512 x 512 image with a Titan X card

Output Video
Generative Adversarial Networks
Generative Adversarial Networks
Generative Adversarial Networks

Source: ImageNet
Markovian Generative Adversarial Networks

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Markovian Generative Adversarial Networks
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Input Photos: CUHK CelebA

Source: Picasso, self-portrait 1907

Discriminative network D

Synthesis Image

VGG 19 Relu4.1

Feature Map

VGG 19 Relu5.1

MSE (content)

Hinge loss (texture)

Feature Map

Neural Patches

VGG 19 Relu3.1
Results

Generative Network G
Results

Generative Network G
Results

Source: Flickr users Kyle, Liana, Isabella & Xavier, macro antonio torres, Steve K

Generative Network G

25 Hz for a 512 x 512 image with a Titan X card
Ulyanov et al. Texture Networks: Feed-forward Synthesis of Textures and Stylized Images

Johnson et al. Perceptual Losses for Real-Time Style Transfer and Super-Resolution
**Ulyanov et al.** Texture Networks: Feed-forward Synthesis of Textures and Stylized Images

![Texture Networks Diagram](image)

**Johnson et al.** Perceptual Losses for Real-Time Style Transfer and Super-Resolution

![Perceptual Losses Diagram](image)
Gaussian Model


Non-Gaussian Manifold

Ours
Non-stochastic Photorealistic Texture

Source: CUHK CelebA
Non-stochastic Photorealistic Texture

Source: CUHK CelebA

- Samples are too sparse to cover the entire face space
- Low degrees of freedom for deformation
Non-stochastic Photorealistic Texture

Source: CUHK CelebA