

Precomputed Real-Time Texture Synthesis with Markovian Generative Adversarial Networks

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Deep Texture Synthesis



Leon A. Gatys et al. A Neural Algorithm of Artistic Style, arXiv 2015, (CVPR 2016).

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

Deep Texture Synthesis



Input Texture

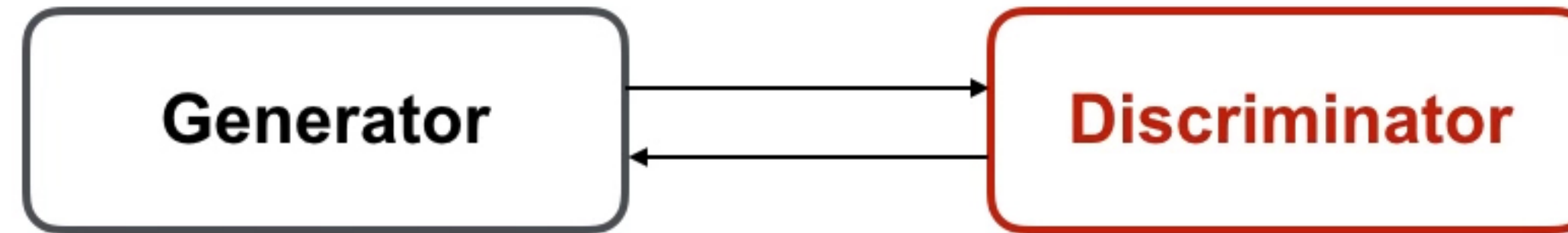
Style Image: Monet, Boats in The Port



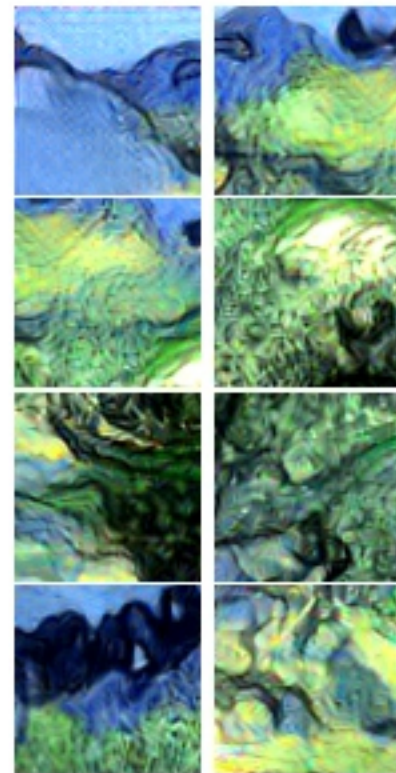
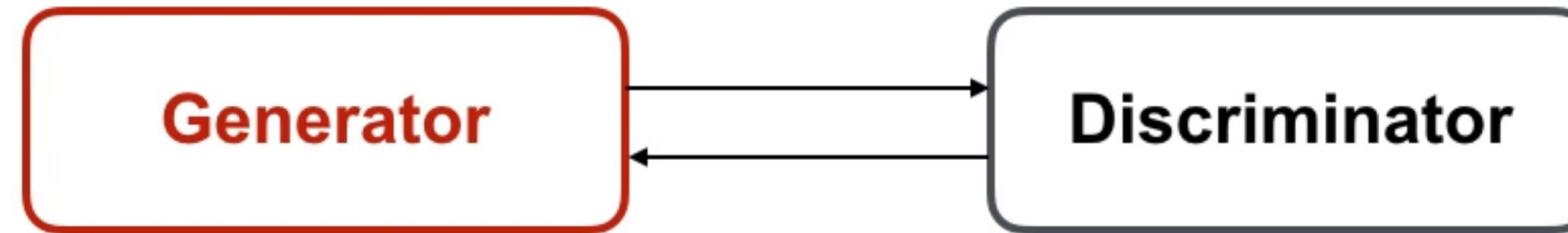
Output Video

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

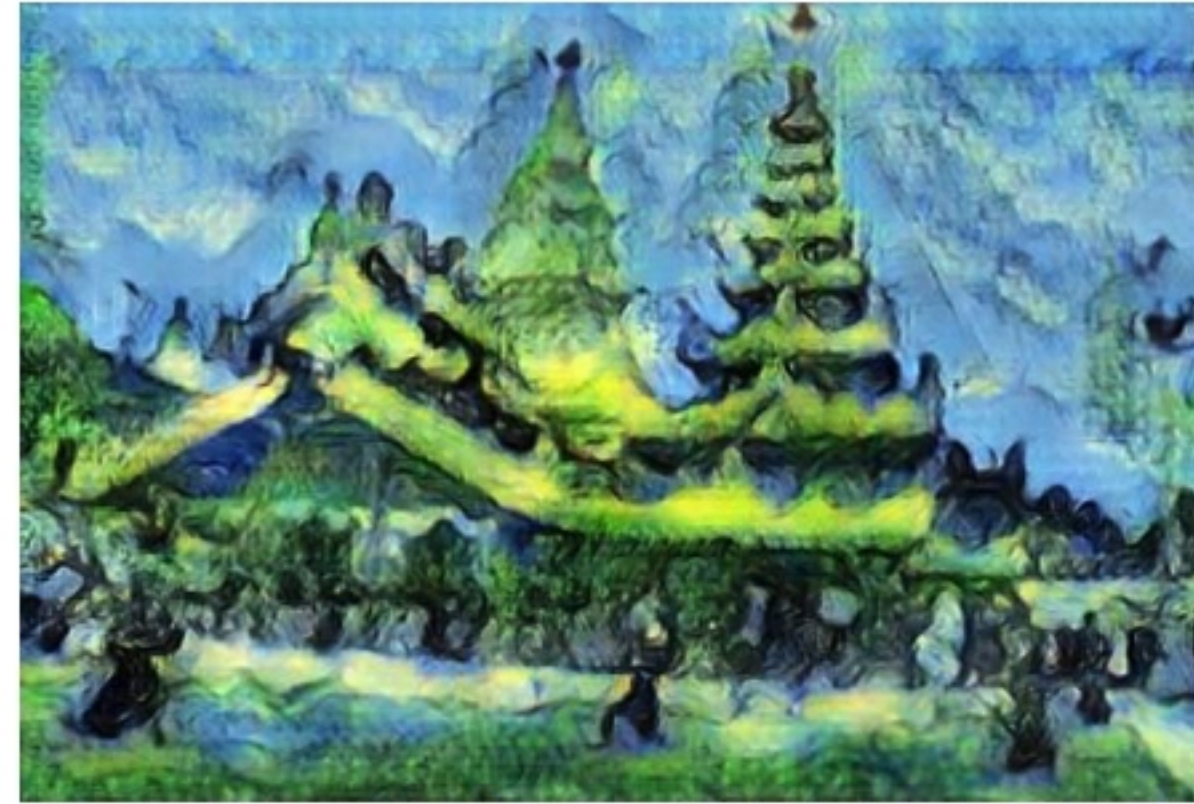
Generative Adversarial Networks



Generative Adversarial Networks

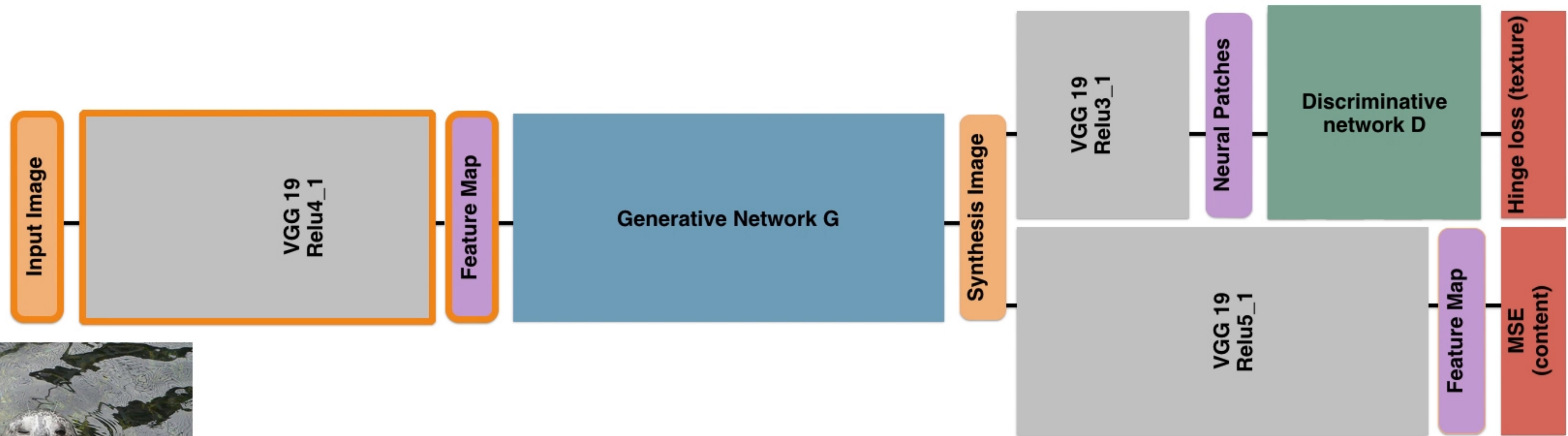


Generative Adversarial Networks



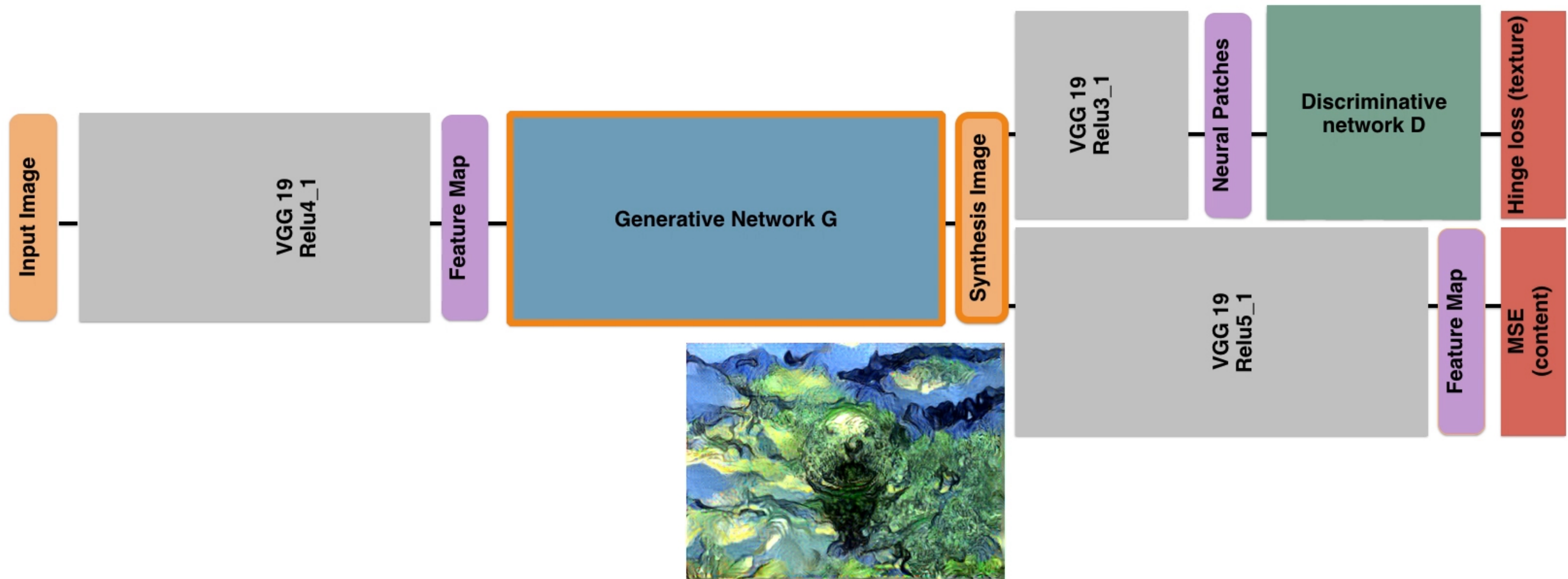
Source: ImageNet

Markovian Generative Adversarial Networks

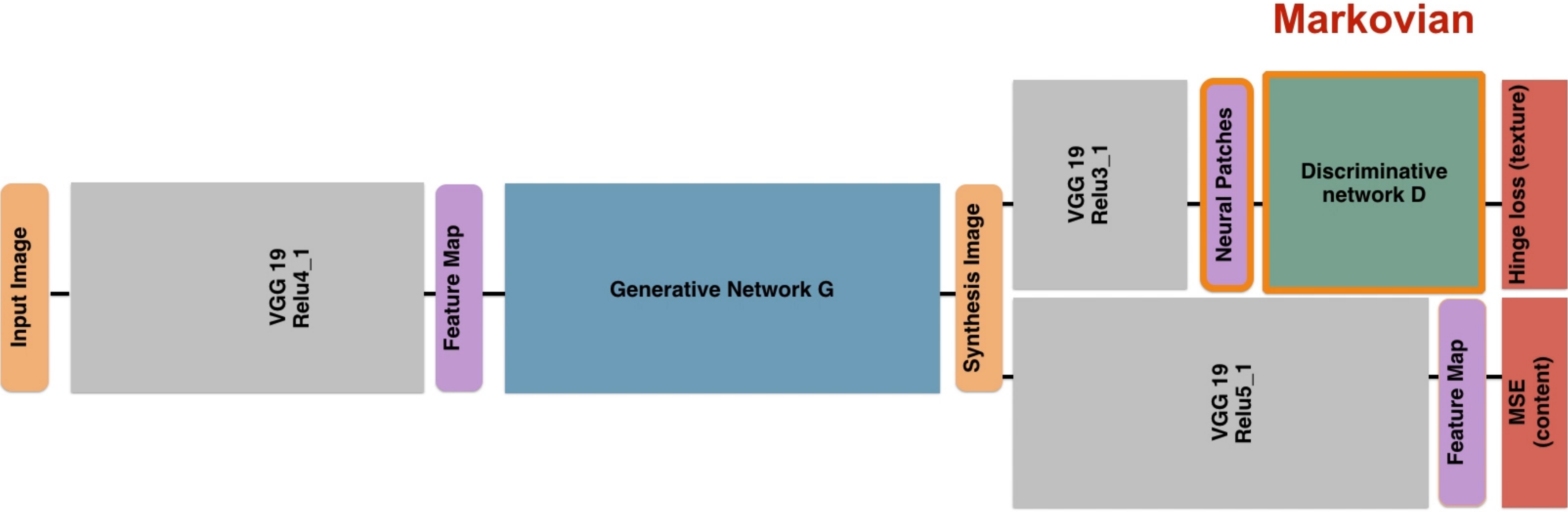


Source: ImageNet

Markovian Generative Adversarial Networks

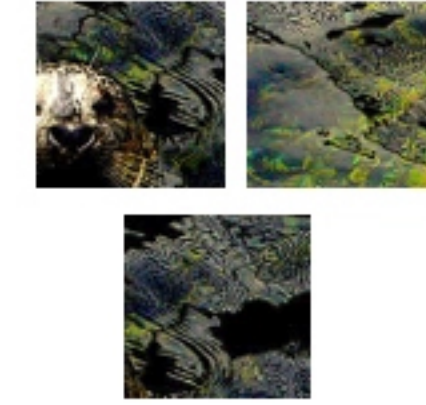


Markovian Generative Adversarial Networks

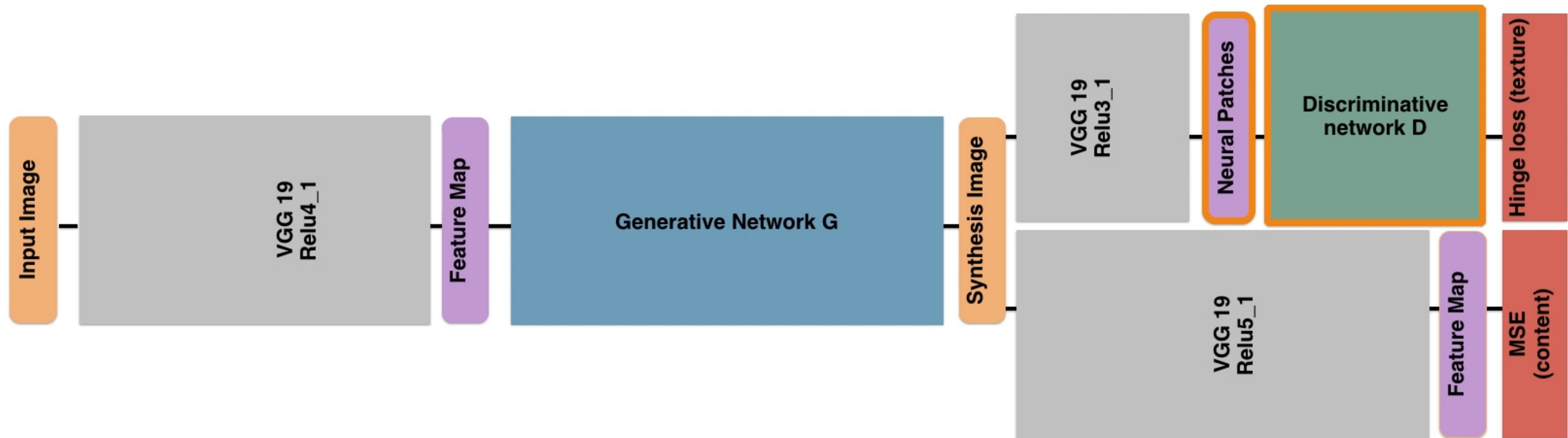


Markovian Generative Adversarial Networks

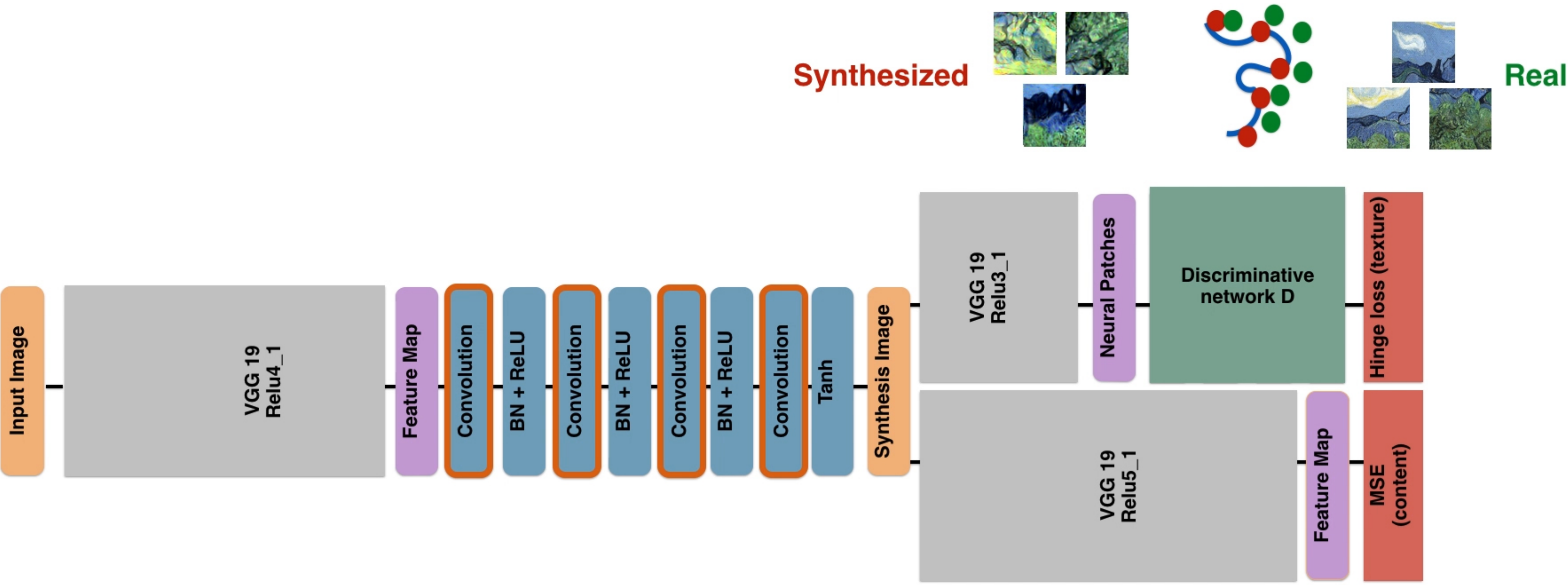
Synthesized



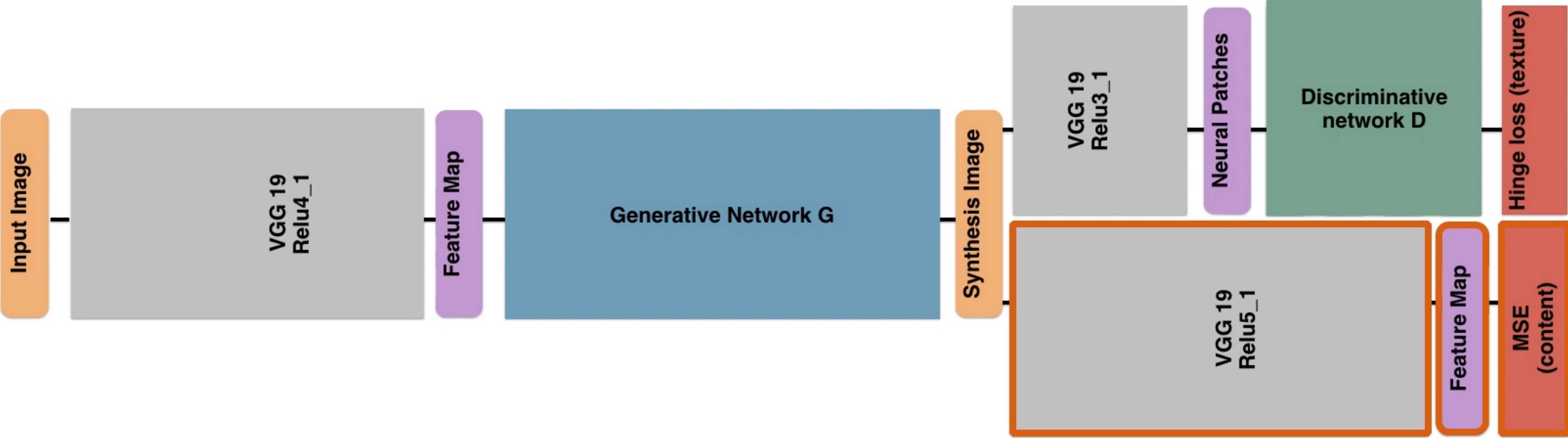
Real



Markovian Generative Adversarial Networks



Markovian Generative Adversarial Networks



Markovian Generative Adversarial Networks

Input Photos

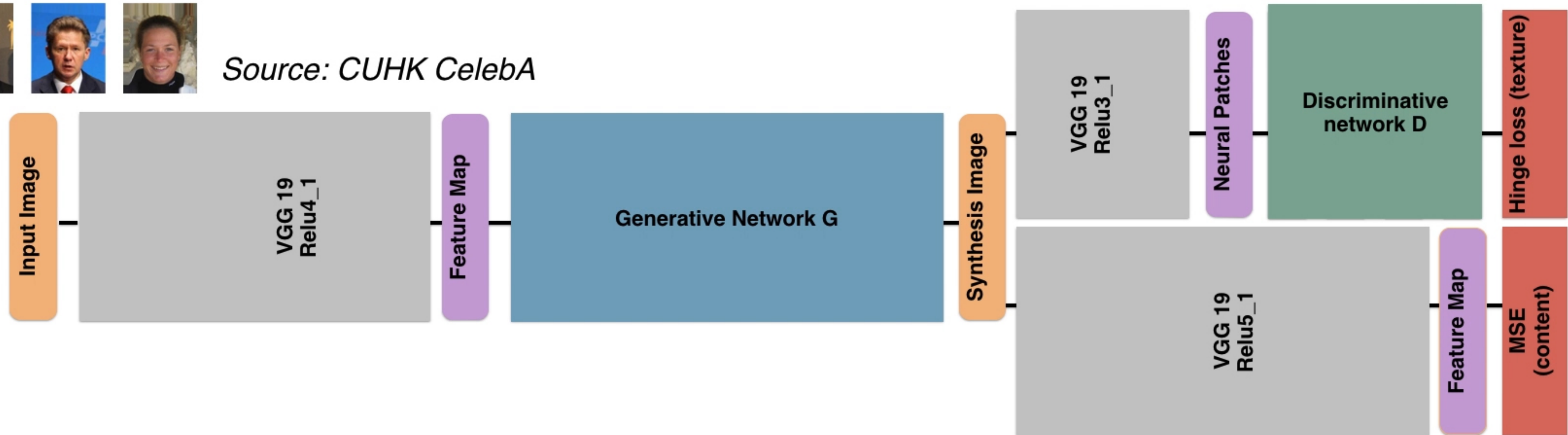


Source: CUHK CelebA

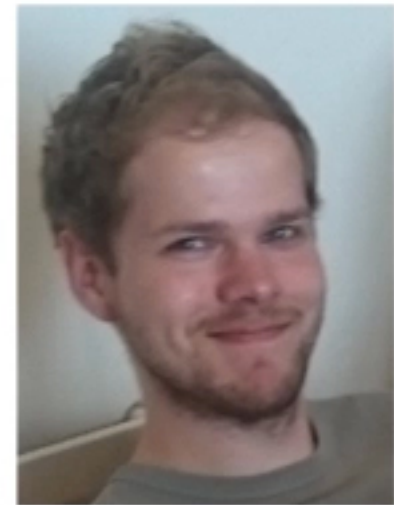
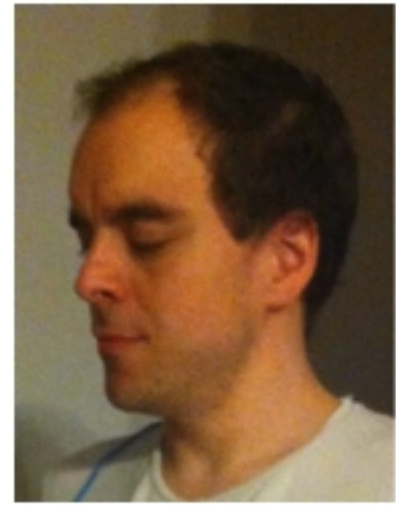
Style Texture



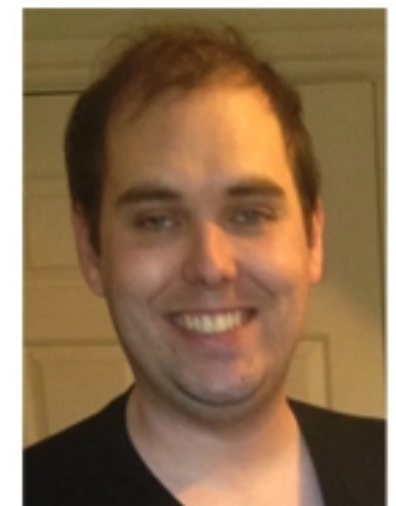
Source: Picasso, self-portrait 1907



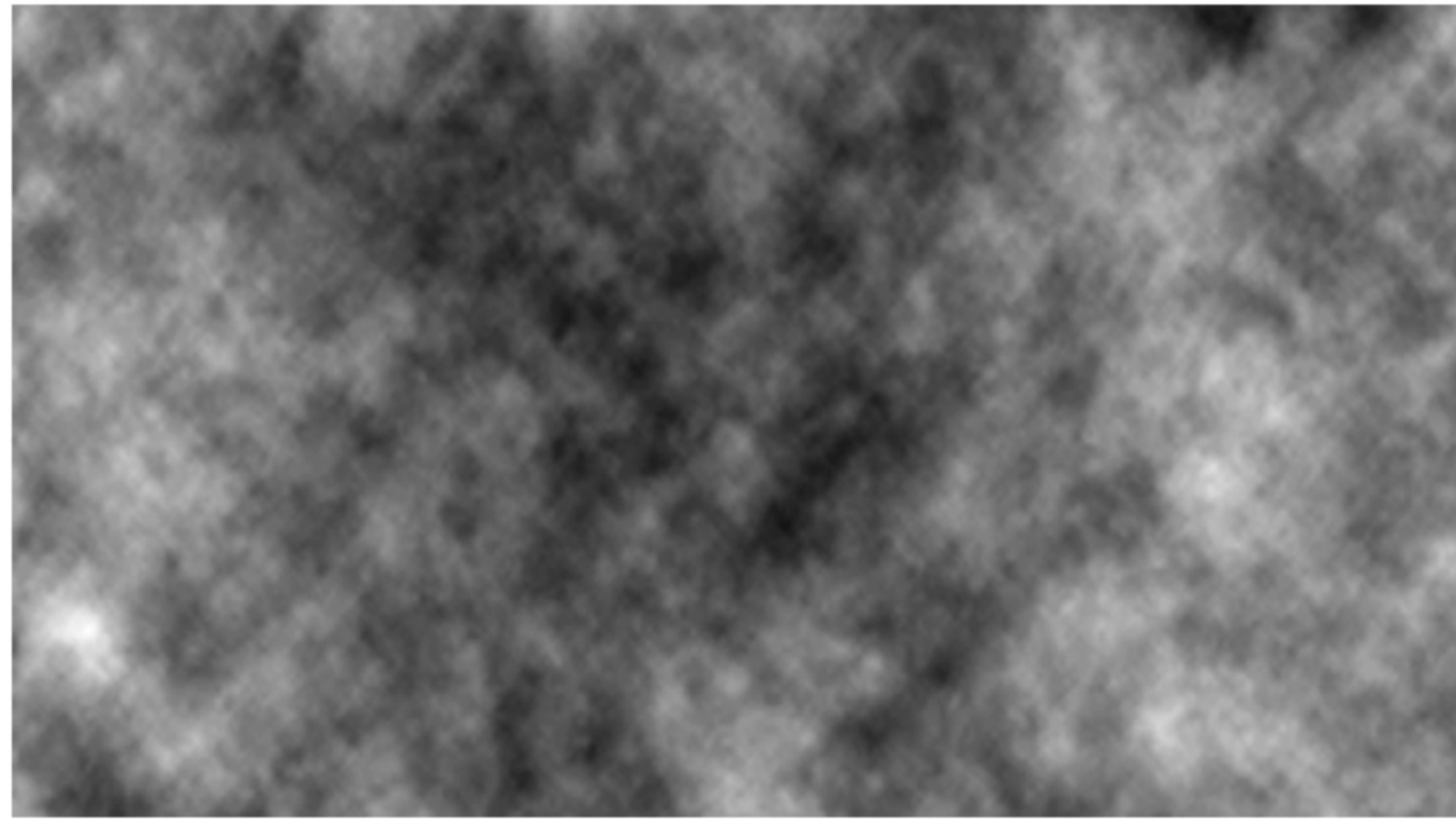
Results



Generative Network G



Results



Generative Network G

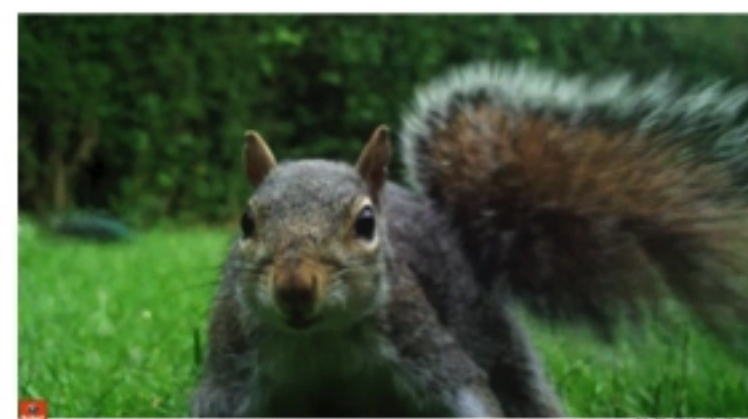
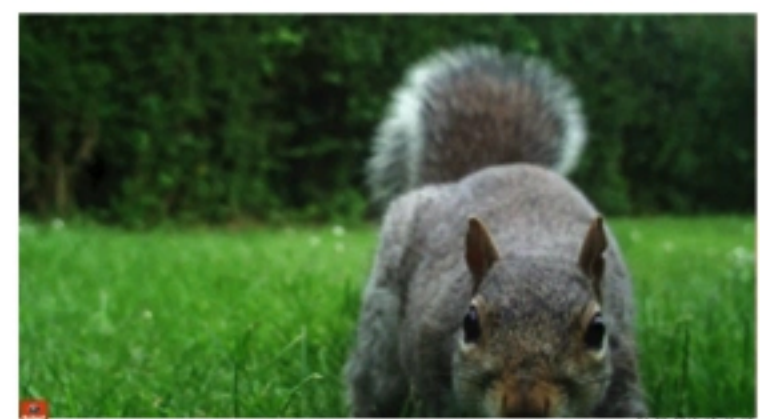


Results

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

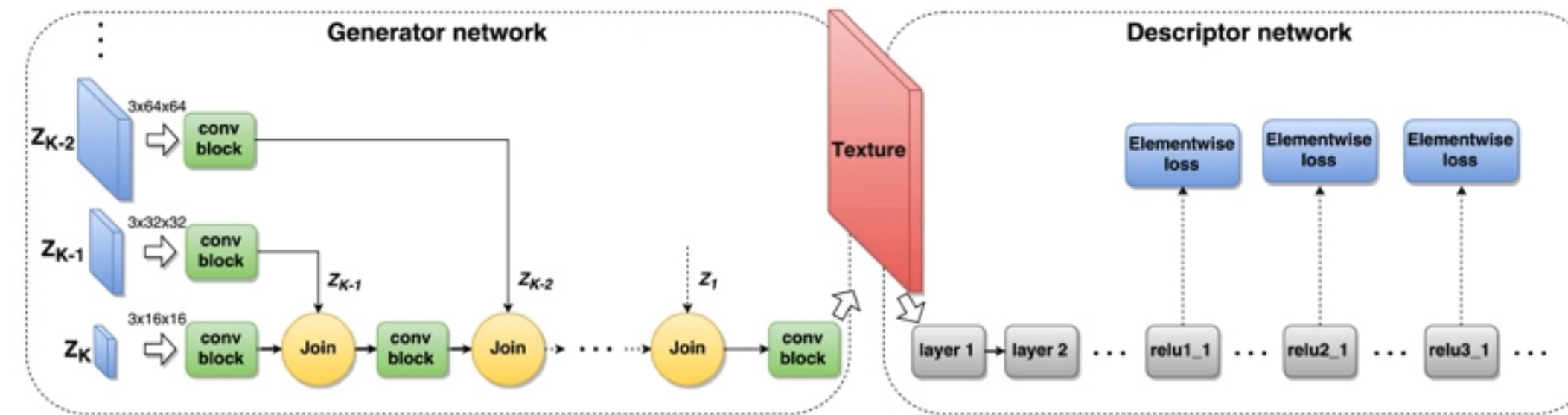


Generative Network G

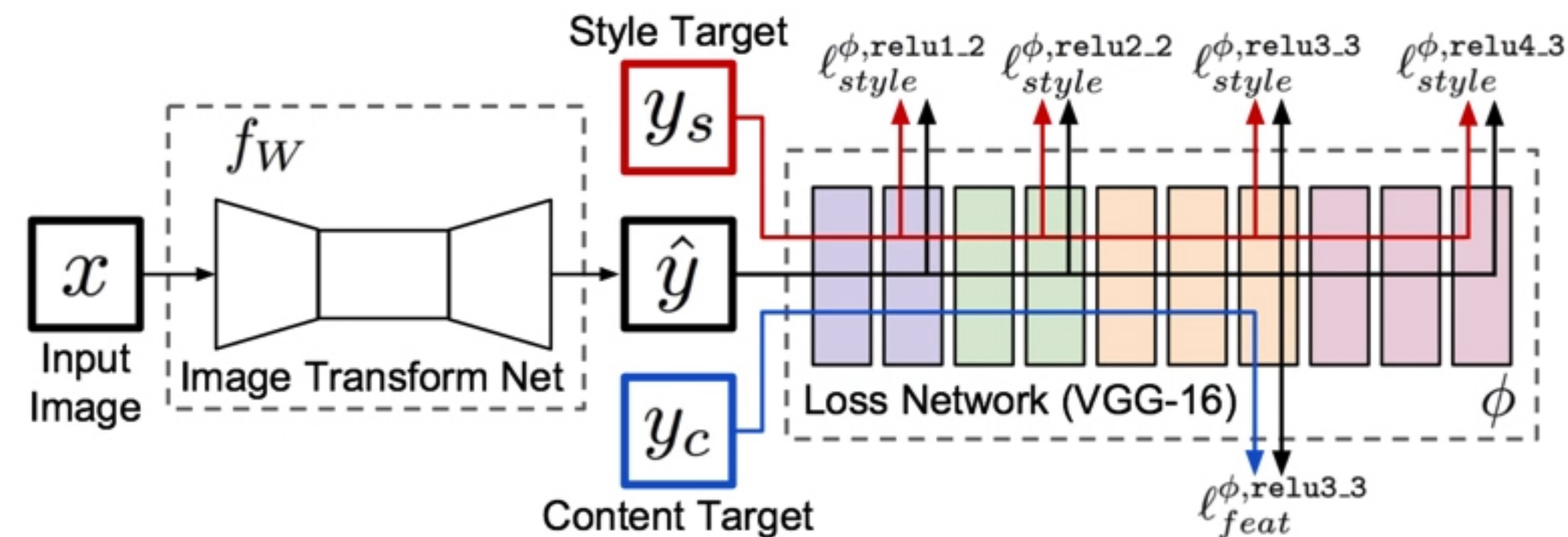


25 Hz for a 512 x 512 image with a Titan X card

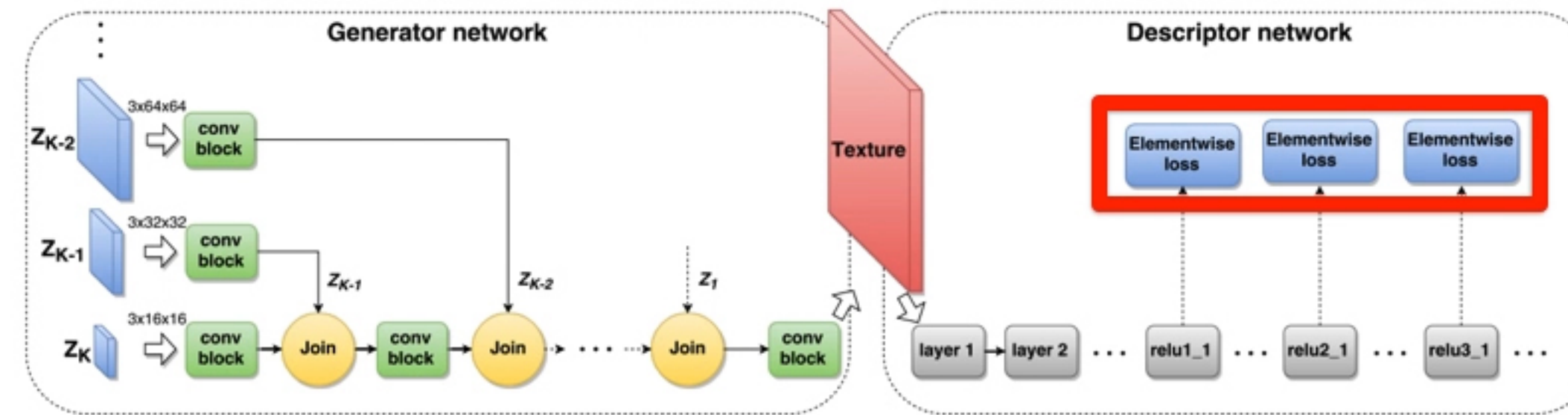
Ulyanov et al. Texture Networks: Feed-forward Synthesis of Textures and Stylized Images



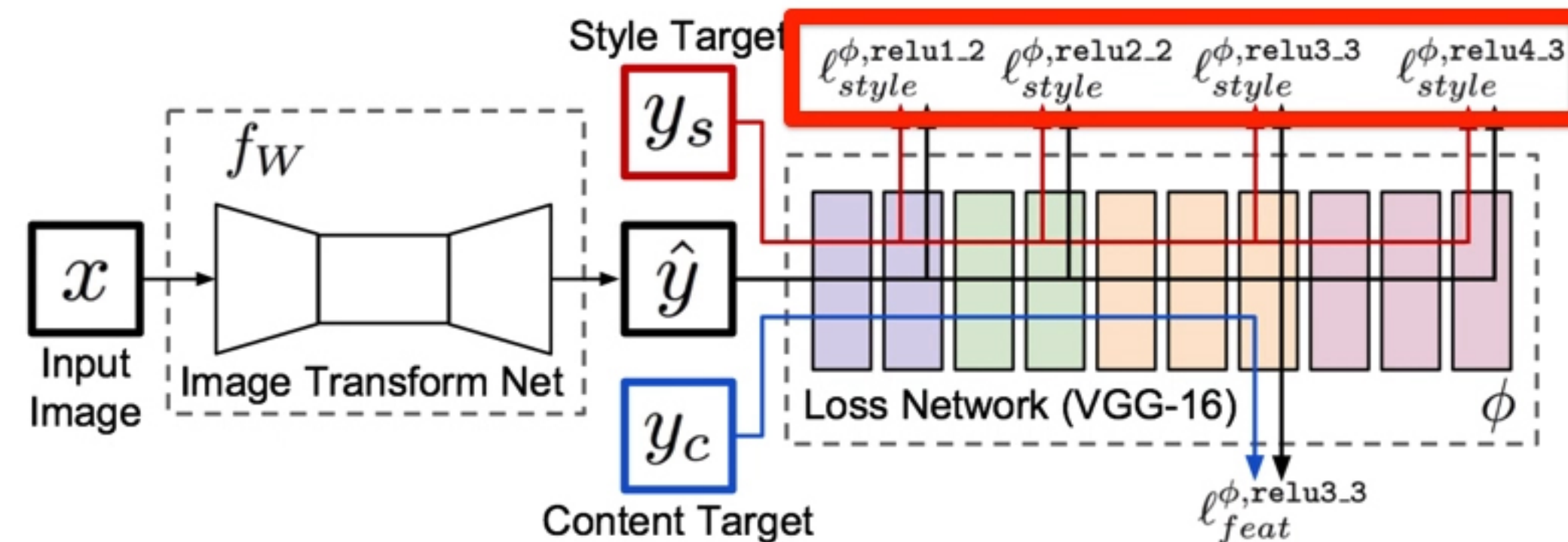
Johnson et al. Perceptual Losses for Real-Time Style Transfer and Super-Resolution



Ulyanov et al. Texture Networks: Feed-forward Synthesis of Textures and Stylized Images

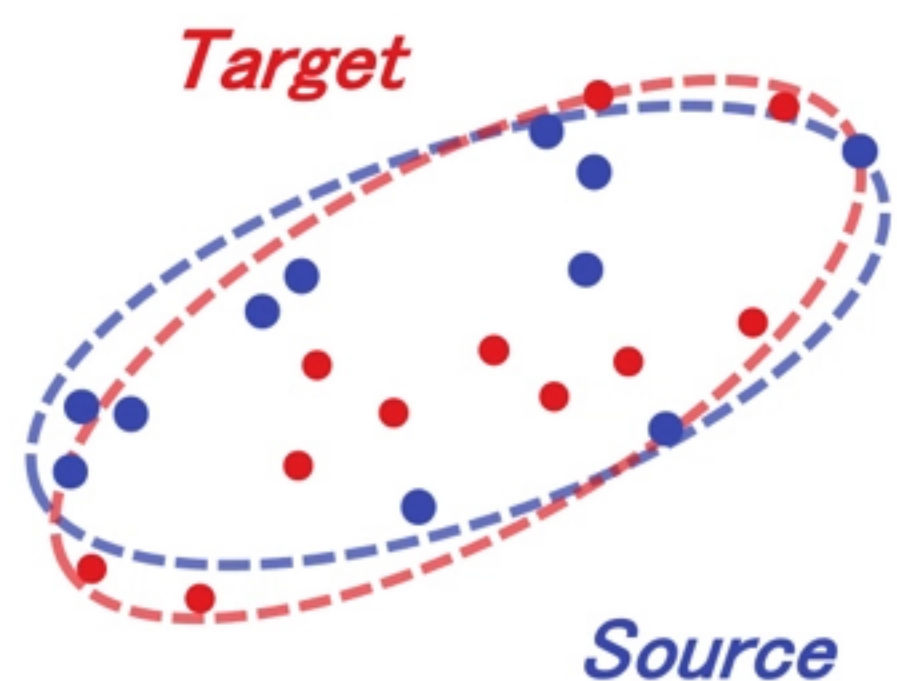


Johnson et al. Perceptual Losses for Real-Time Style Transfer and Super-Resolution





Source: Mosaic ducks
Massimo, Photographed
by Marie-Lan Nguyen

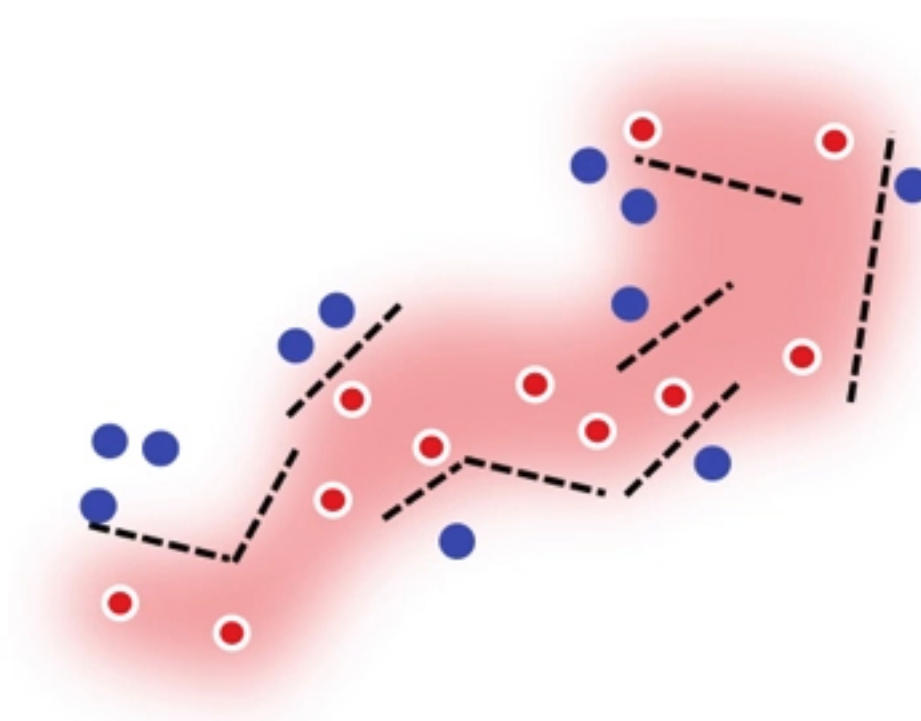


Gaussian Model

Leon A. Gatys et al. A Neural Algorithm of Artistic Style, CVPR 2016.

Ulyanov et al. Texture Networks: Feed-forward Synthesis of Textures and Stylized Images, ICML 2016.

Johnson et al. Perceptual Losses for Real-Time Style Transfer and Super-Resolution, ECCV 2016.



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



Source: CUHK CelebA

