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IMAGE INPAINTING

What Is Image Inpainting?

Image inpainting is the process of reconstructing missing parts of an image so that observers are unable to tell that these regions have undergone restoration. This technique is often used to remove unwanted objects from an image or to restore damaged portions of old photos.

Data Set

To create a set of test images, we cut thirty-three 256×256-pixel patches out of photos from a diverse collection.

We then filled a 72x72-pixel square at the center of each patch with black.

Then We randomized those pixel holes .

Train & Test

We ran each image both on an Auto-Encoder net and GAN to fill those holes .

Both nets were trained by comparing their output to the original image .

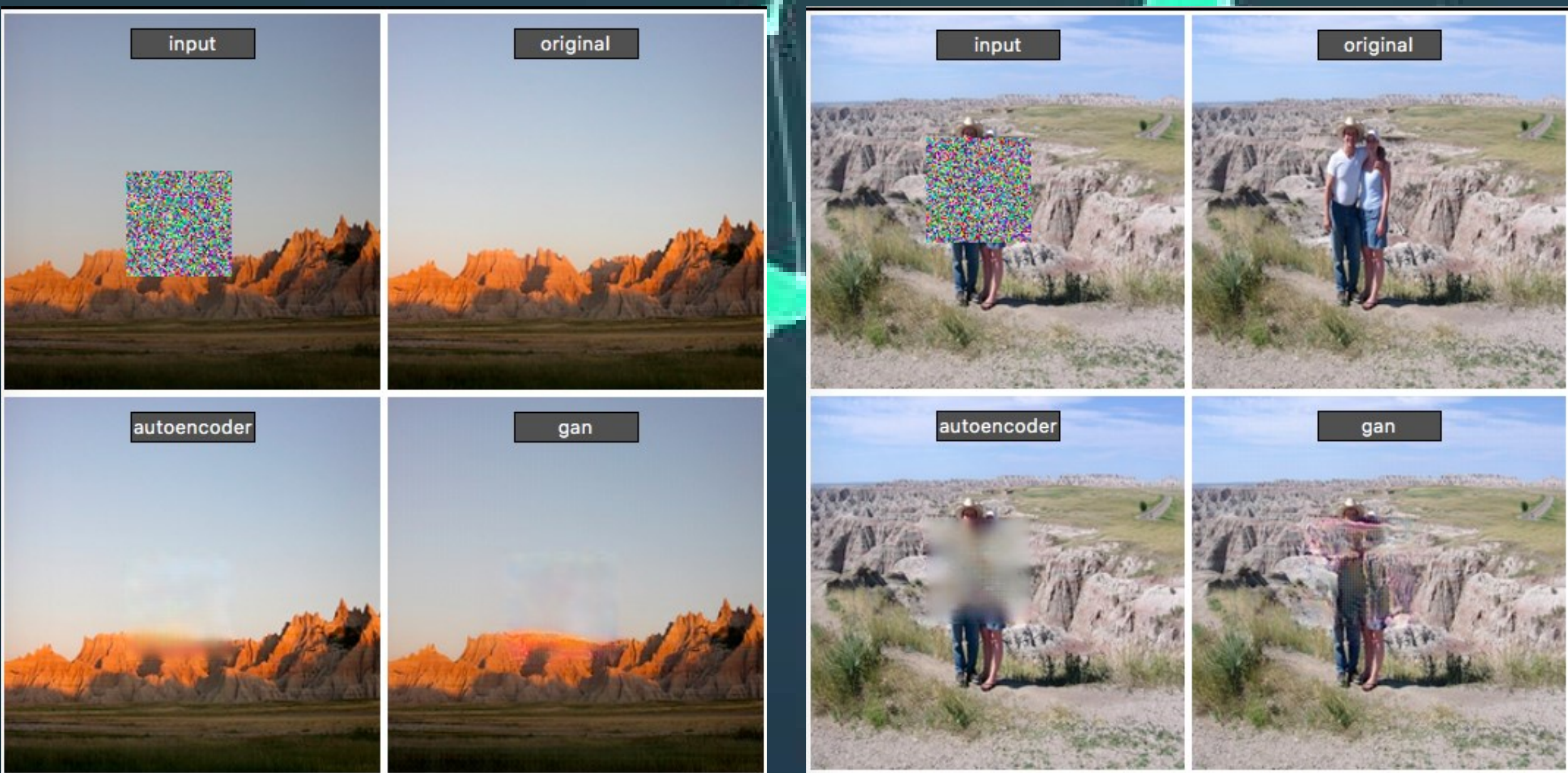
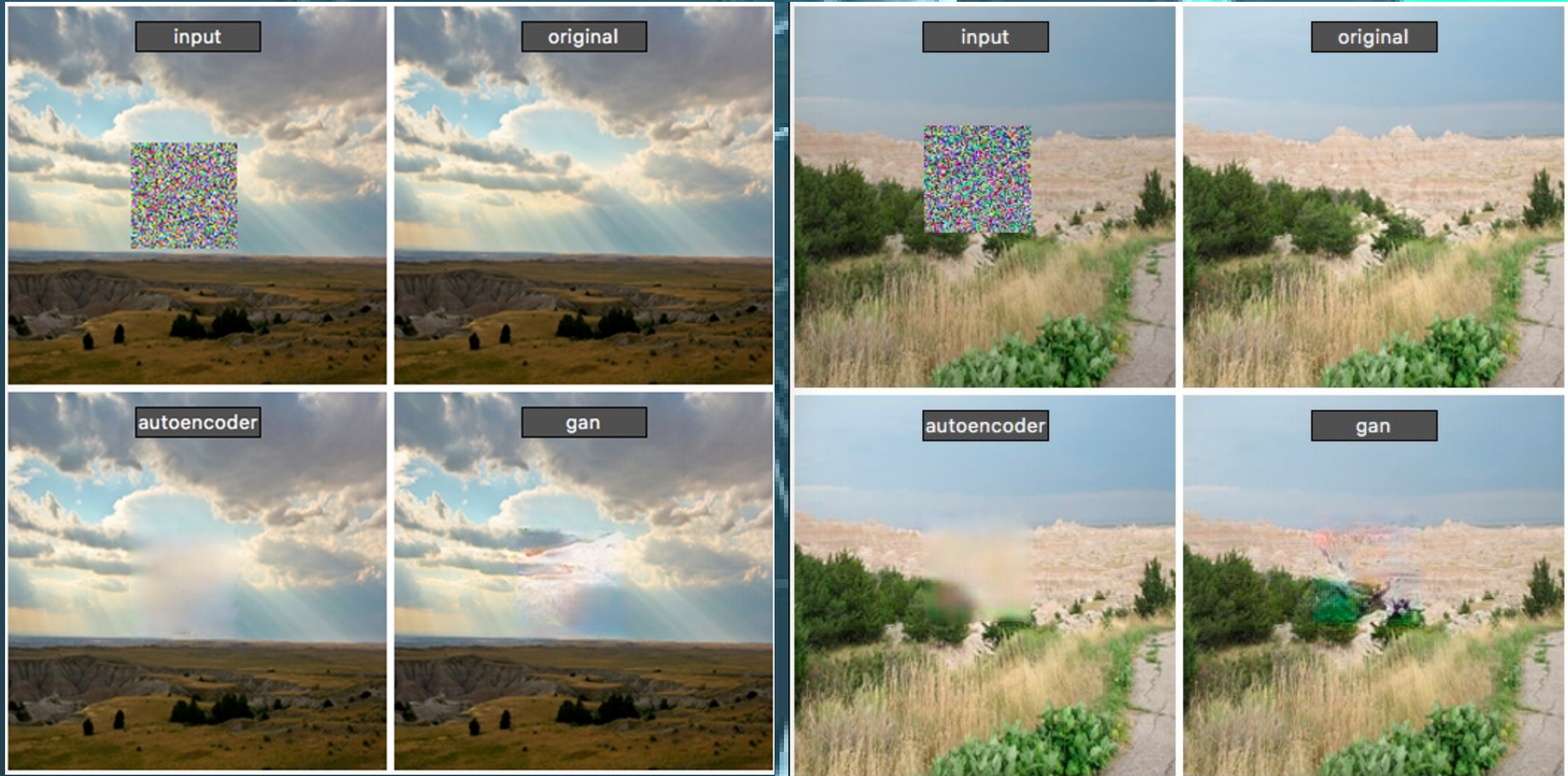
The figures below show example image-inpainting results.

Conclusion

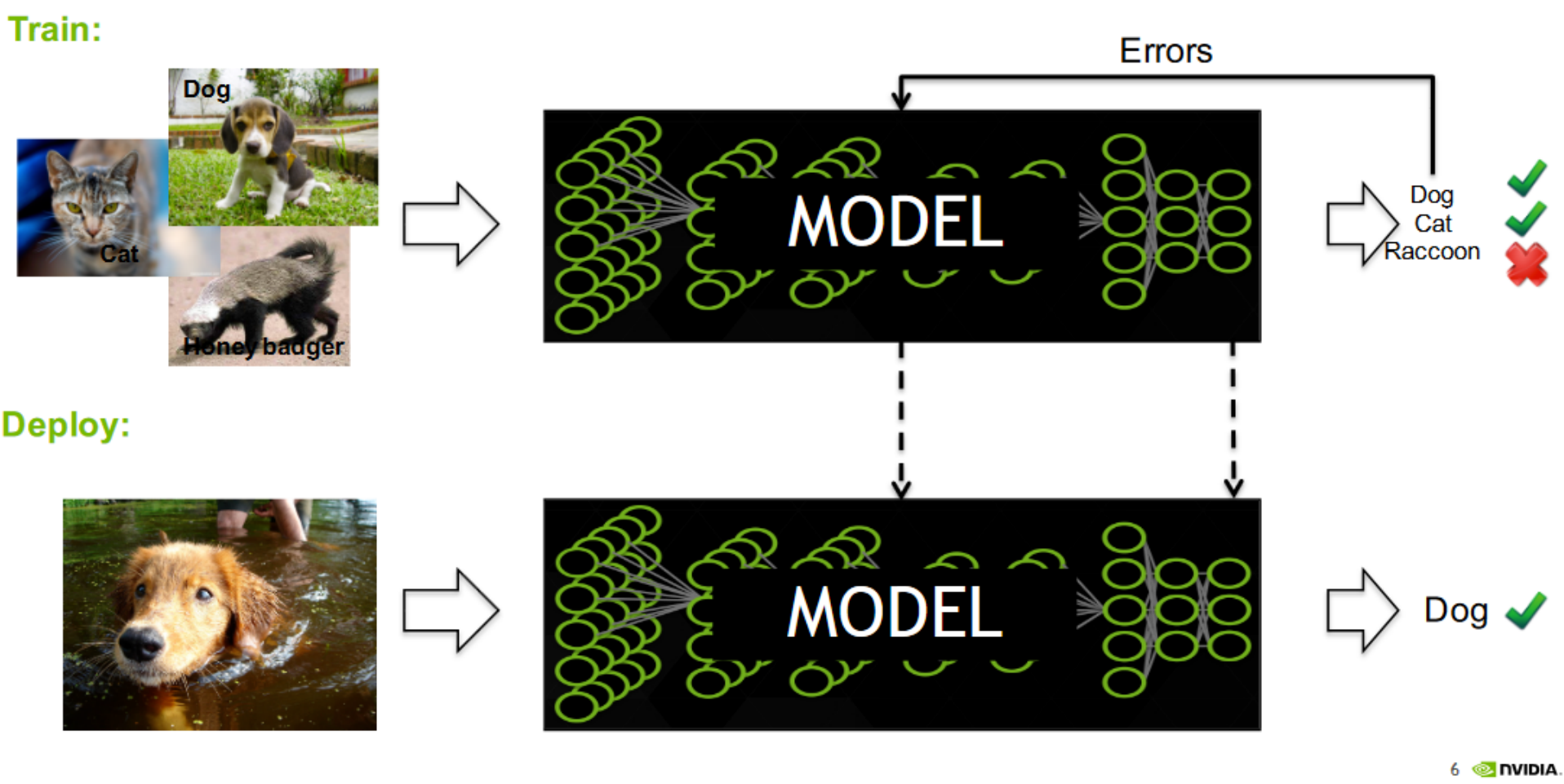
Our study of automatic image-inpainting methods allows us to draw the following conclusions:

- Gan network generates better results , but is harder to train compared to the Auto-Encoder
- Both networks get better results on a specific type of data . (also GAN responds better to new kind of data)
- Gan is better in generating new data , compared to Auto-Encoder that must get the environment .

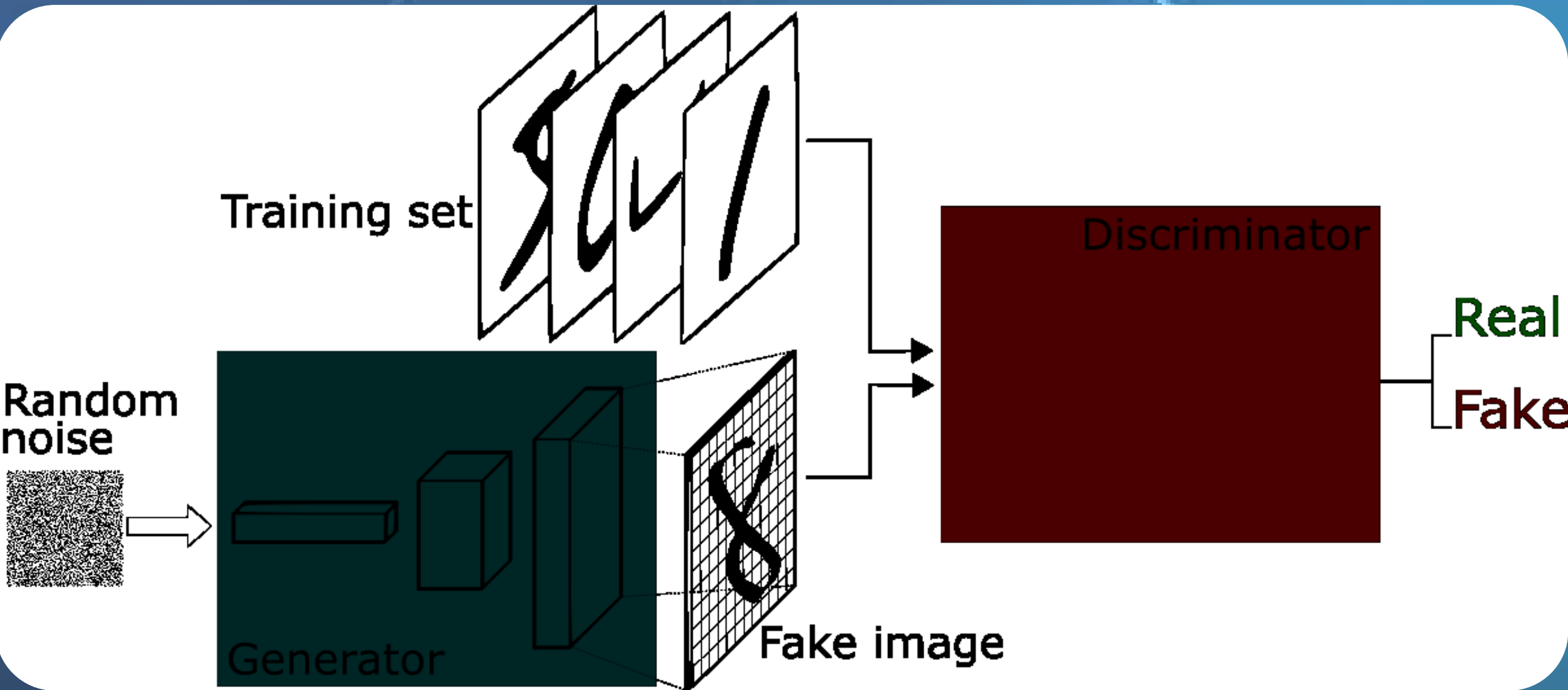
Results



Deep learning approach



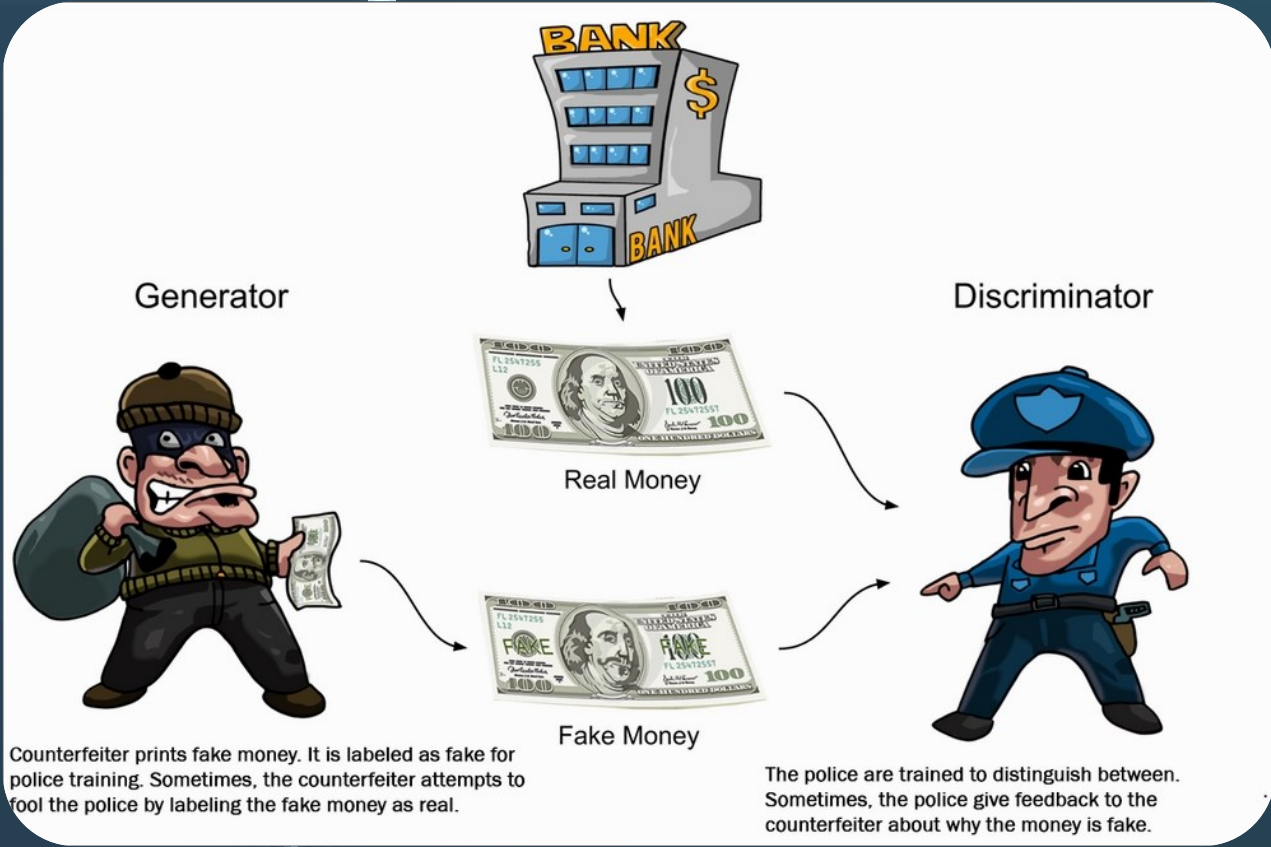
GAN



$$\min_{\theta_g} \max_{\theta_d} \left[\mathbb{E}_{x \sim p_{data}} \log D_{\theta_d}(x) + \mathbb{E}_{z \sim p(z)} \log(1 - D_{\theta_d}(G_{\theta_g}(z))) \right]$$

Discriminator output for real data x Discriminator output for generated fake data G(z)

Objective Function



AUTOENCODER

