A brief introduction to Generative Adversarial Networks (GANs)

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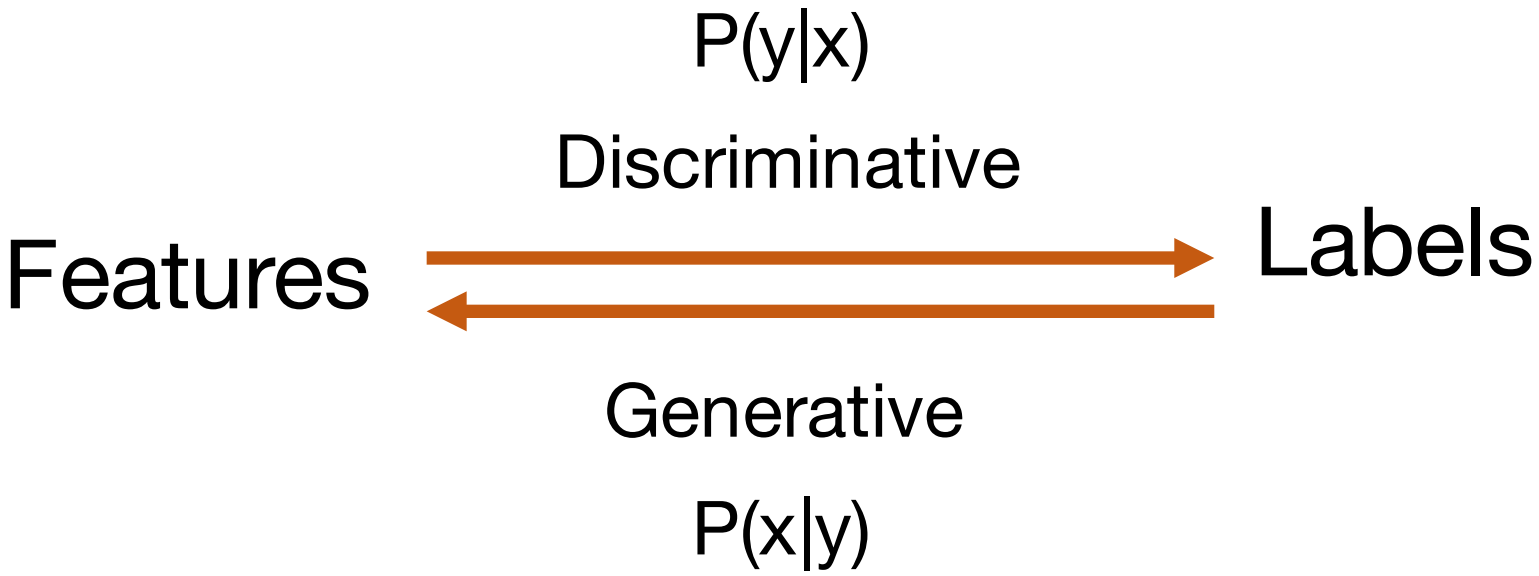
2019 SSA Machine Learning Workshop

Generative vs. Discriminative algorithms



Discriminative models learn the boundary between classes
Generative models learn the distribution of individual classes

Generative Adversarial Networks

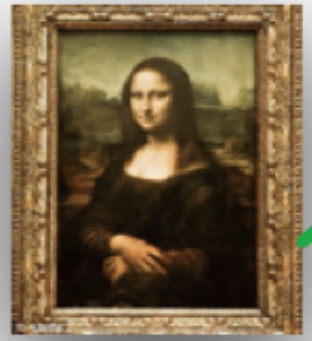
D: Detective

Generative Adversarial Networks

https://arxiv.org › stat ▾

by IJ Goodfellow - 2014 - Cited by 8400 - Related articles

Jun 10, 2014 - Authors:**Ian J. Goodfellow**, Jean Pouget-Abadie, Mehdi Mirza, Bing Xu, David Warde-Farley, Sherjil Ozair, Aaron Courville, Yoshua Bengio.



R: Real Data

G: Generator (Forger)

I: Input for Generator

Facebook's AI research director Yann LeCun: adversarial training is "the most interesting idea in the last 10 years in ML."

Synthetic human faces

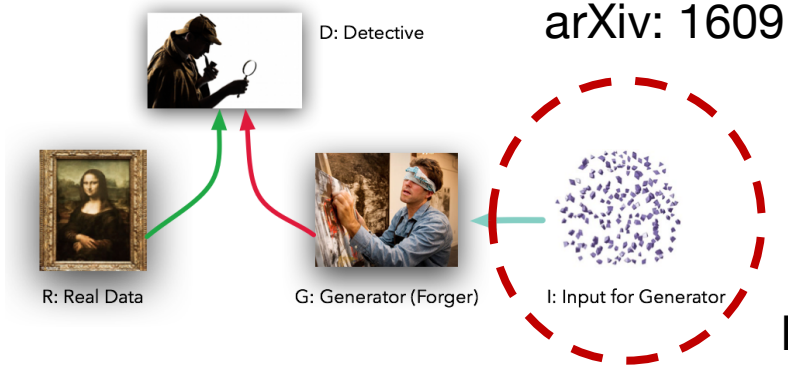
Credit: arXiv:1812.04948

Synthetic arts

Credit: arXiv 1706.07068

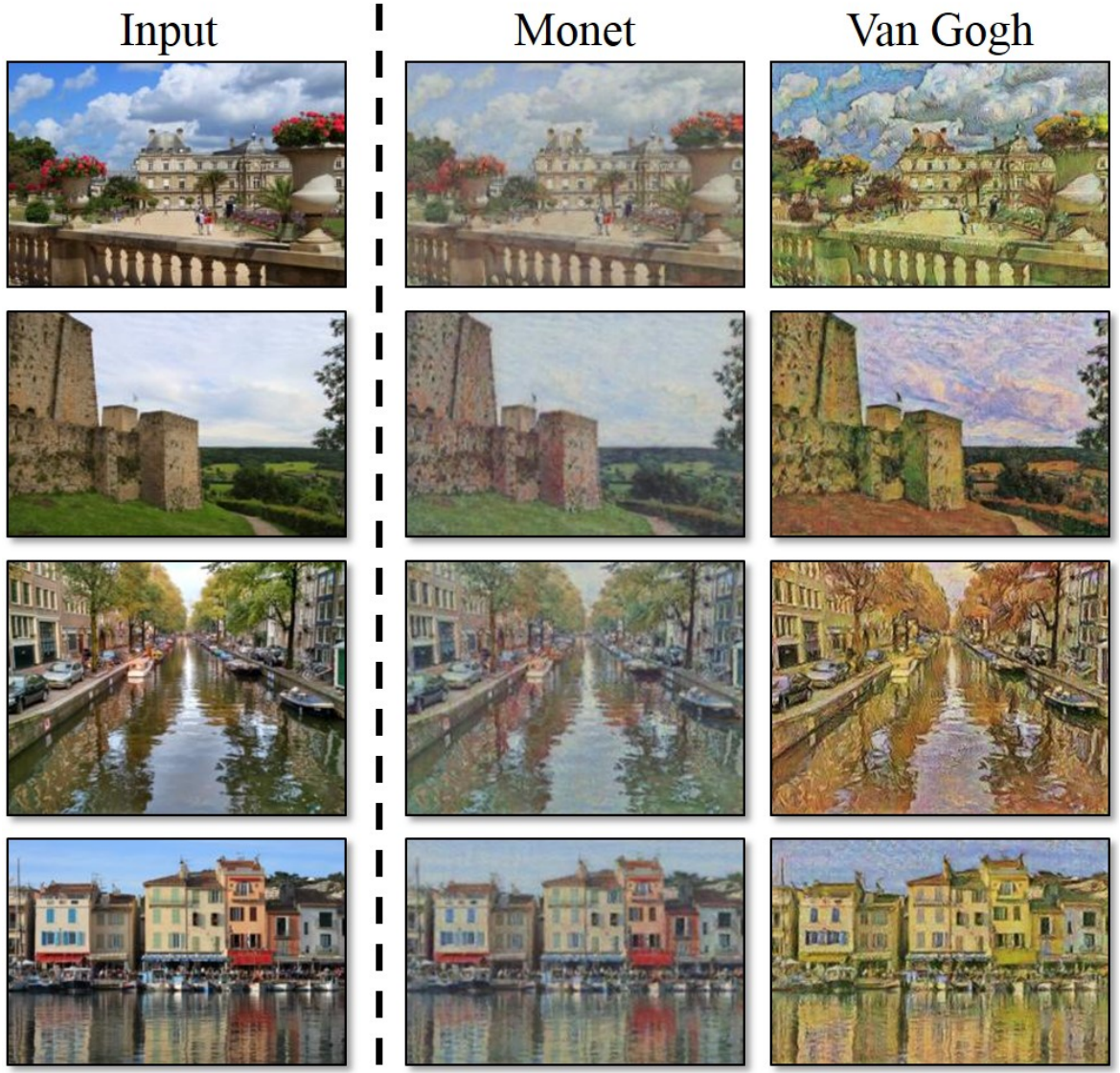
Super resolution

arXiv: 1609.04802



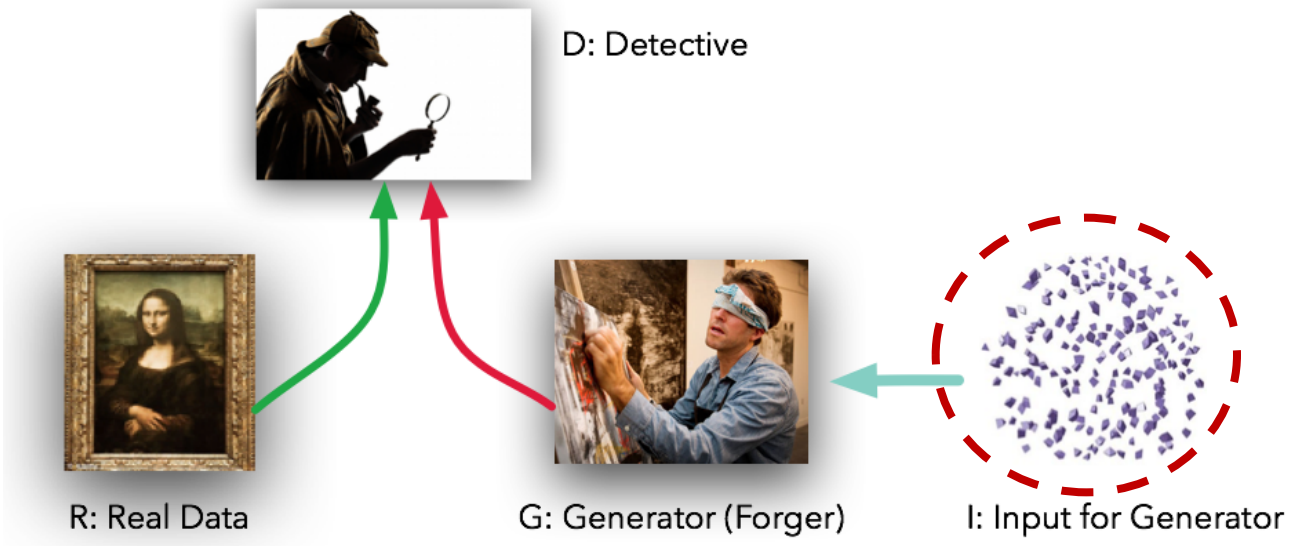
Meaningful input

Photo-to-painting styles



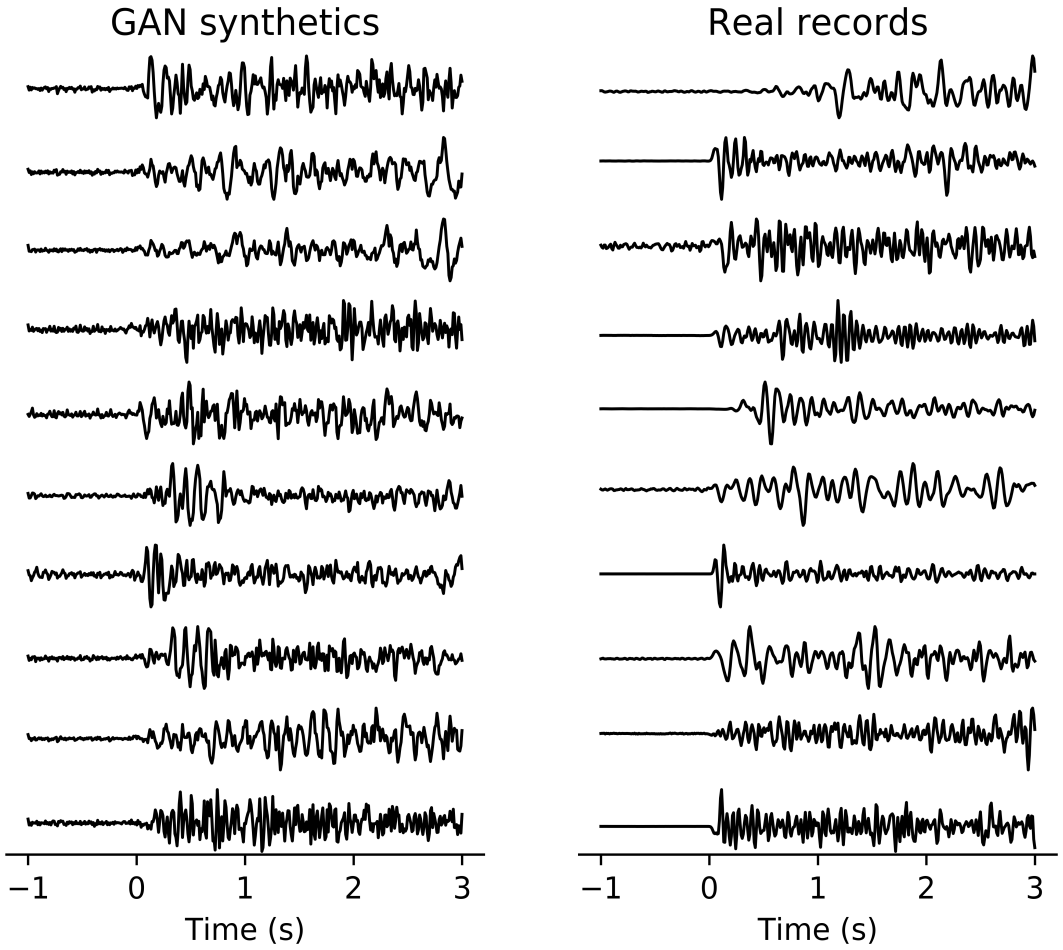
https://github.com/junyanz/CycleGAN

GAN for synthetic seismic waves



Real seismic waves

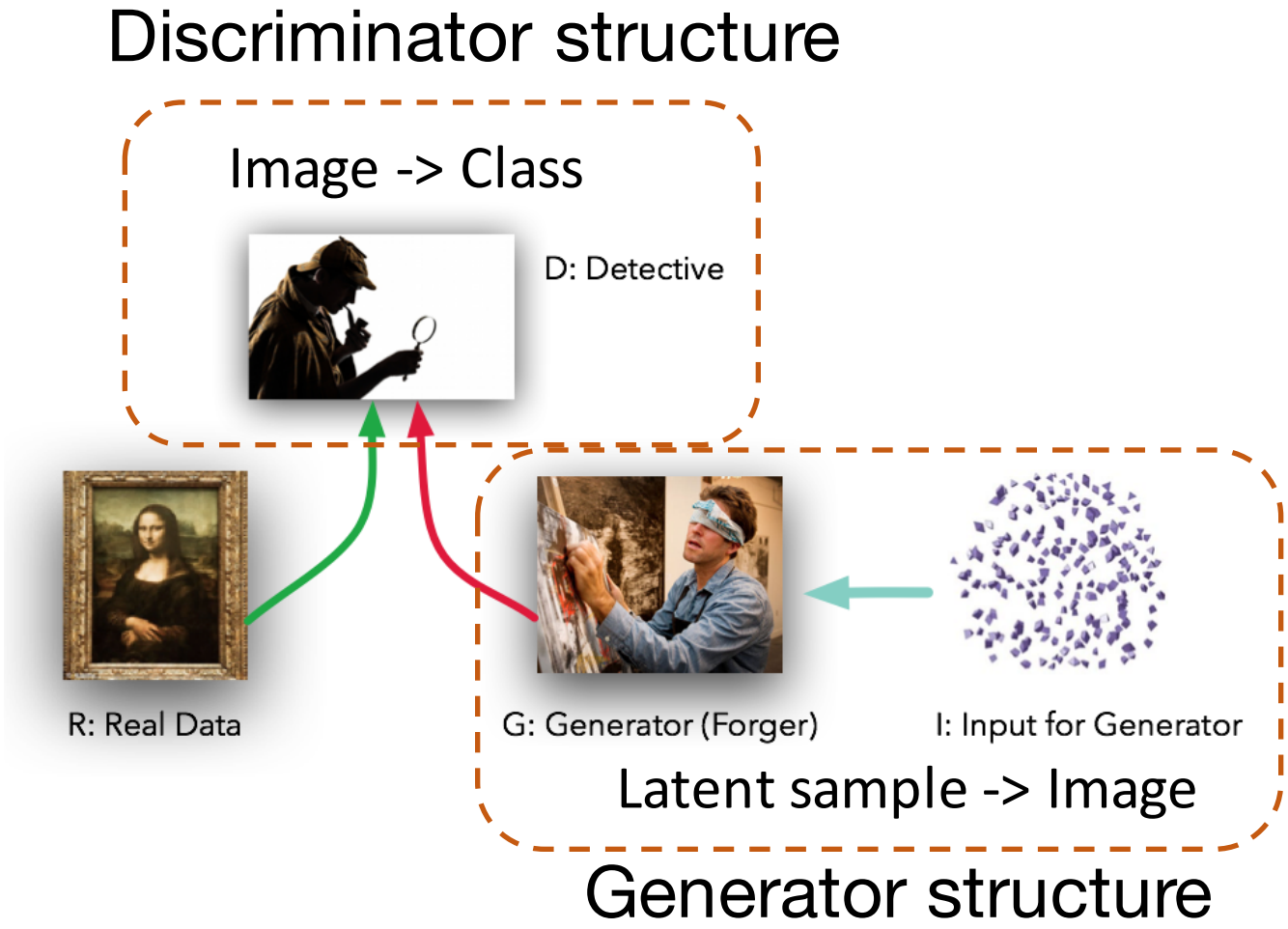
Random numbers



Li et al, GRL, 2018

GAN with Keras: Networks' structures

https://github.com/eriklindernoren/Keras-GAN/blob/master/gan/gan.py



GAN with Keras: Training process

https://github.com/eriklindernoren/Keras-GAN/blob/master/gan/gan.py

Train the Discriminator

Train the Generator