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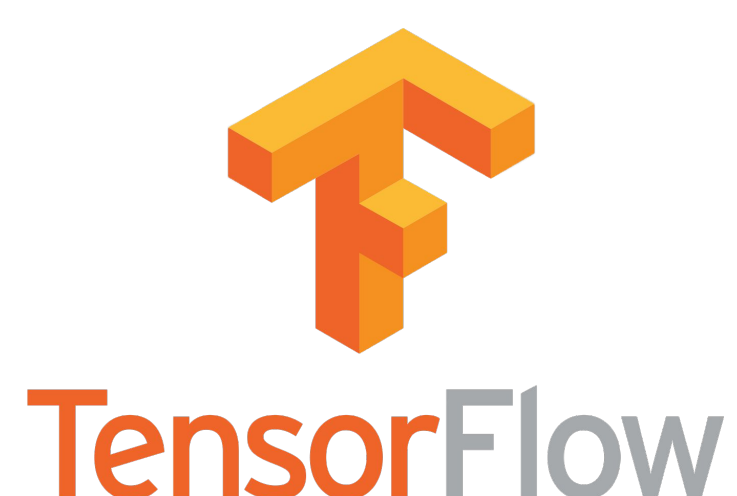
artemis

BE-BOUND



deeplearning.ai

Used technologies



Caffe

A whole compression scheme improvement

Prediction, super resolution and colorization improved with neural networks

- The compression process we tried to improve consists in grayscaling an input picture, downsizing it, converting it in the BPG format, enlarging it with super resolution (SR), and then recolorizing it.
- Our aim was to improve the main part of this scheme with deep neural networks (NNs), and especially convolutional NNs (CNNs).

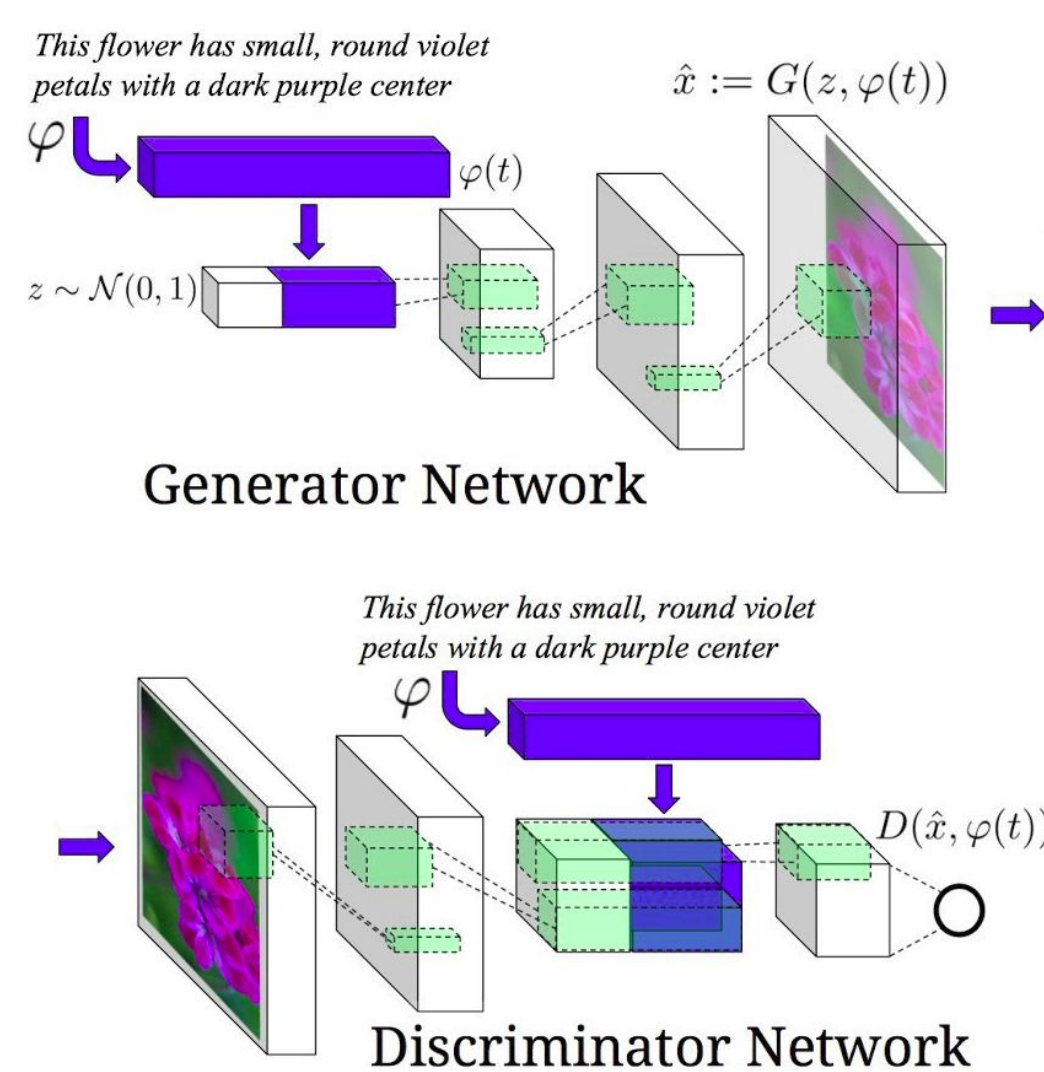
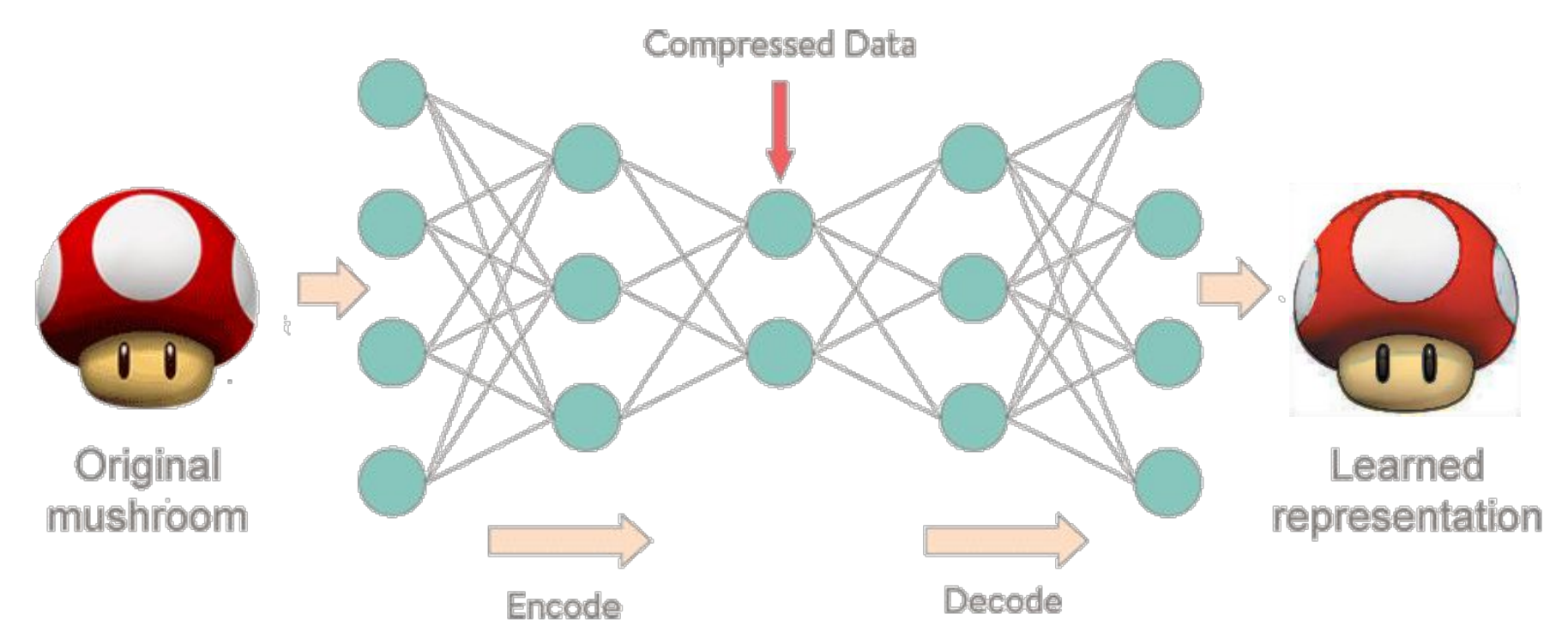


Figure: GANs principle

Super Resolution with Generative Adversarial Networks

SRGAN: an “evolution” of SRCNN

- SR is needed in order to transform a low resolution image (the compressed one) into a high resolution image (the one received by the destination). Enlarging images implies to **predict** the values of the additional pixels between the original.
- This can be achieved with methods based on NN like SRCNN (SR by CNN), but SRGAN is so far the more effective we tried. It consists in a generator NN which generate images according to several parameters, and trained by a discriminator NN.

Colorization

A trick to gain performance

- Processing pictures in grayscale instead of colored ones allows to reduce their size by using only one color channel rather than RGB channels. Thus, we chose to deal with the color information only at the end of the compression; with colorization.
- Colors got with NNs are completely generated by the algorithm and may differ with the original colors. Despite it, the synthesized images are as realistic as the original ones.



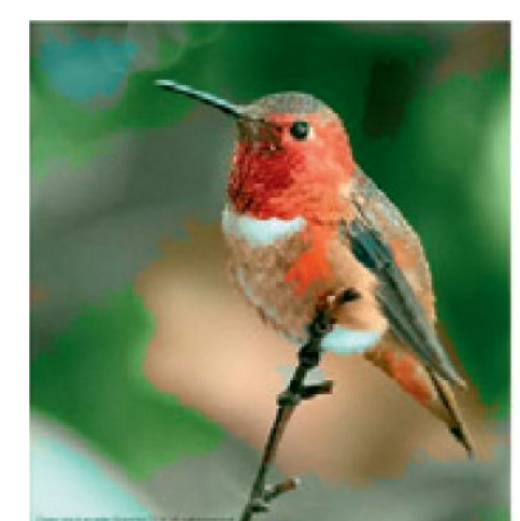
Original image



Grayscaled image



Zero-cost colorized



Low-cost colorized