

COLORIZATION OF ANIMATION

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Problem Definition

We investigate a subcategory of colorizations: automatic colorizations in Manga (Japanese comics). Most manga are drawn without colors until they are made into animations and aired on televisions. We think automatic colorization in manga can be beneficial in providing readers with more pleasant and comprehensive reading experience, though it can also be generalized and expected to work on any hand-drawn images.

Data Acquisition

75 episodes of Pokemon (15 hours of videos)
 Sampled images per 50 frames
 Generated grayscale images by MATLAB
 22417 training examples
 2493 validation examples
 3269 test examples
 Zoomed to 180 x 320 from 360 x 640 pixels

Results

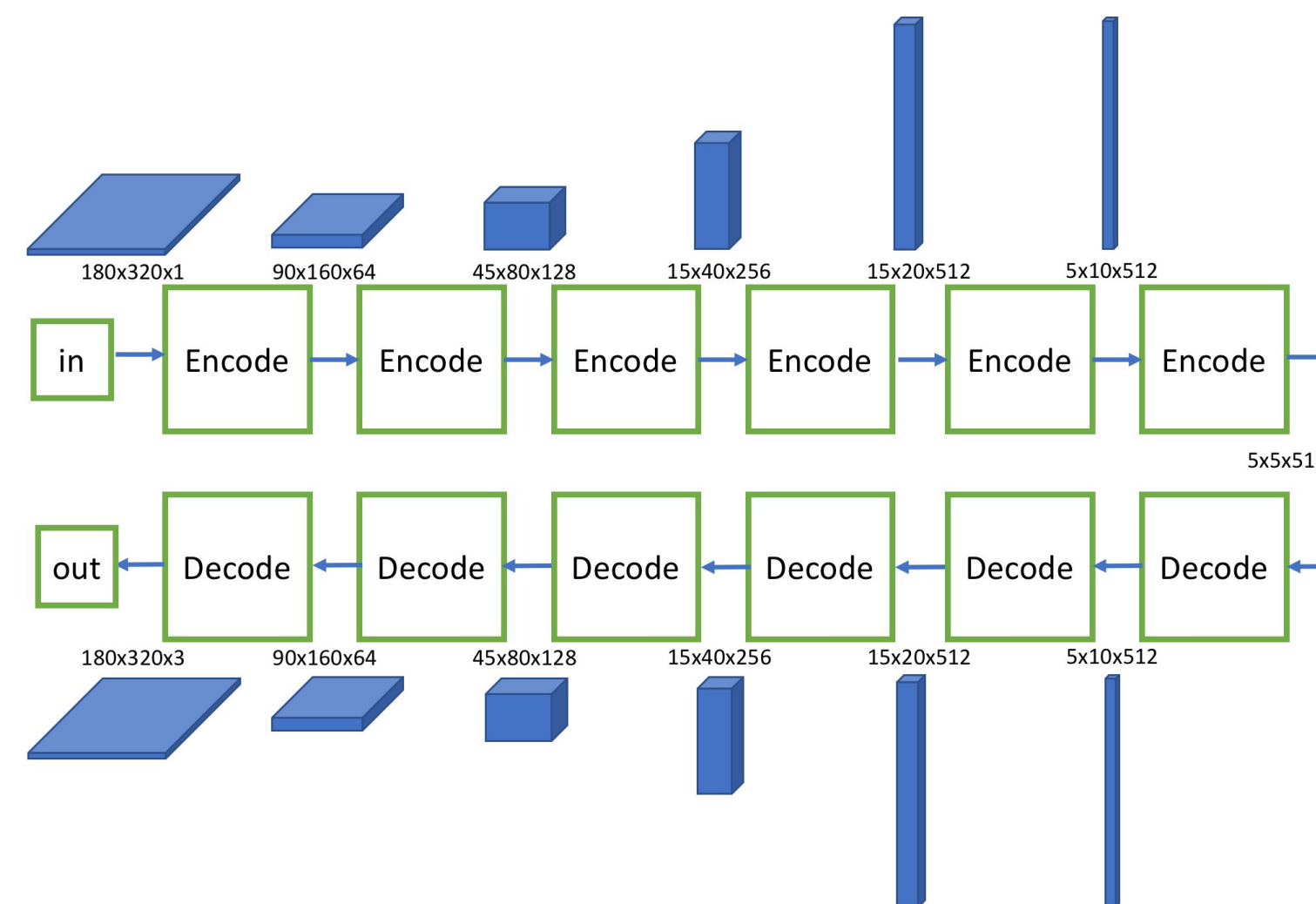
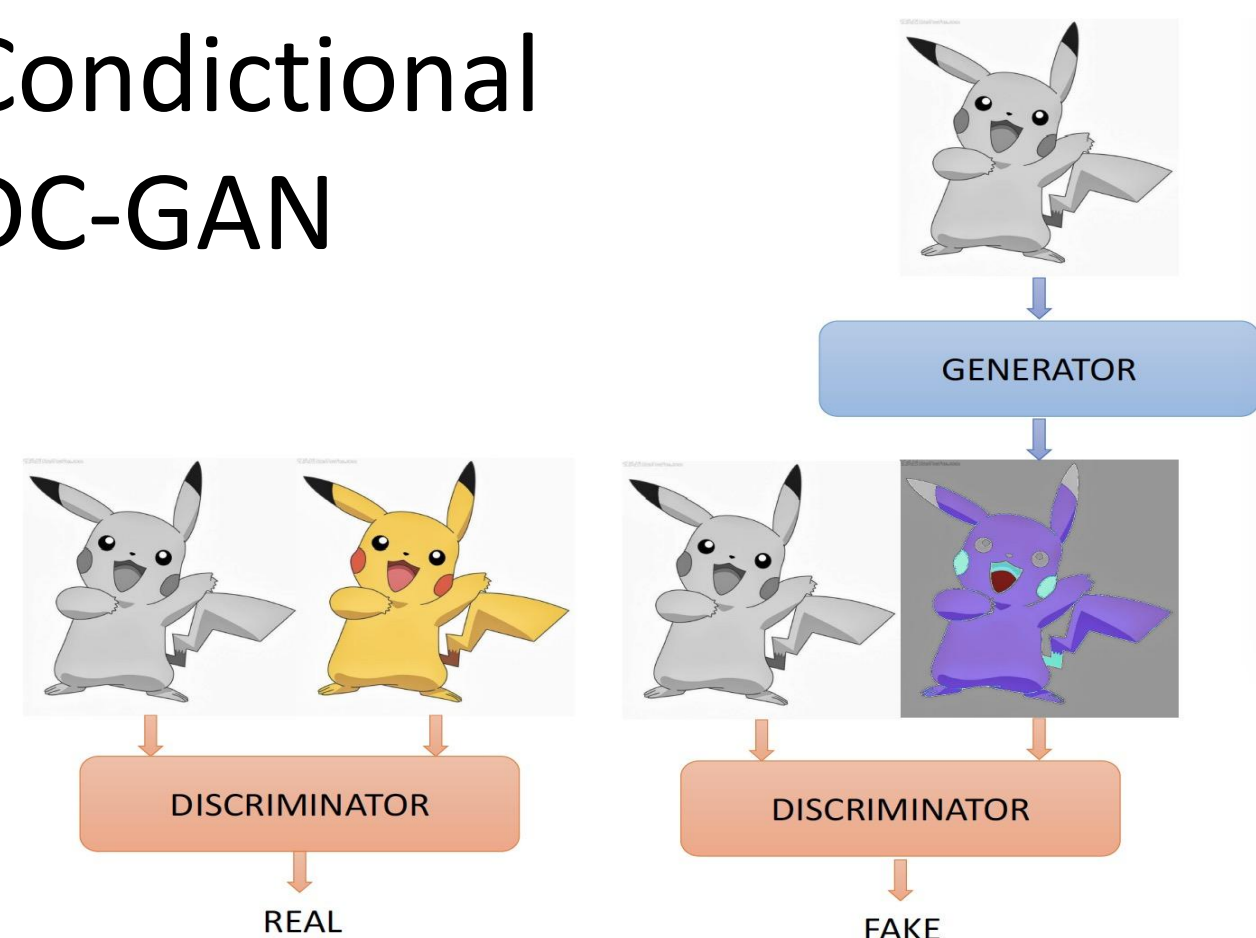
Generated by Conv-Net



Generated by Gan

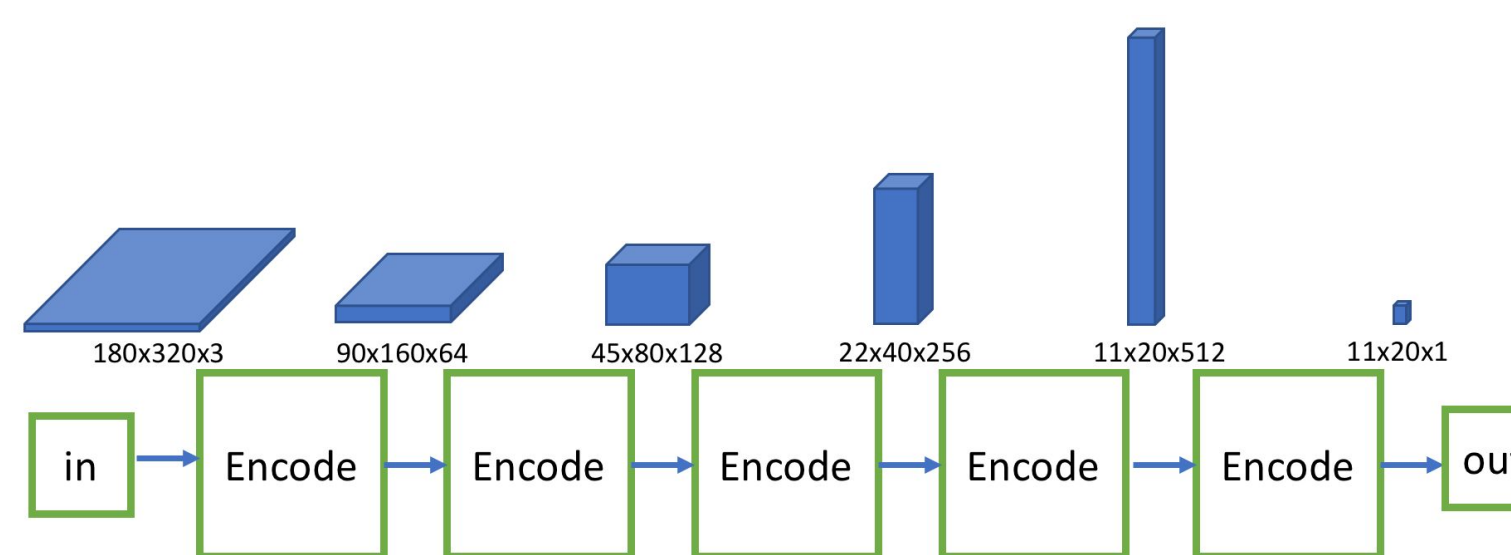
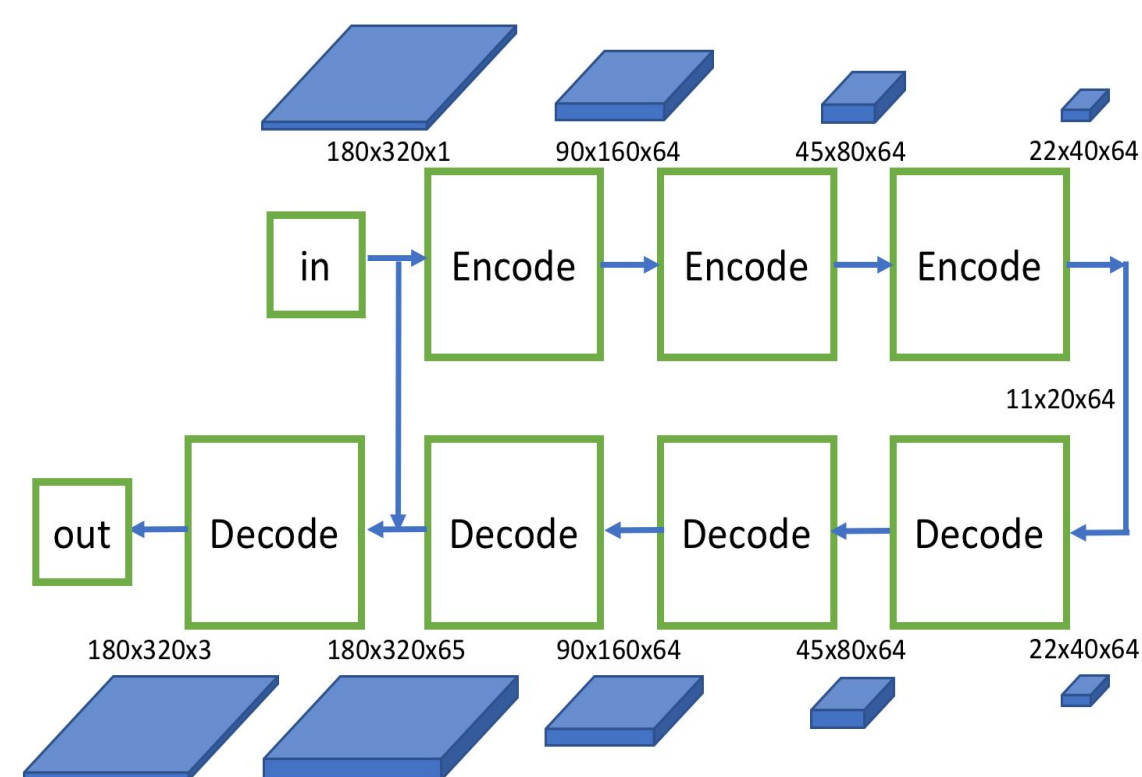


Conditional DC-GAN



GAN - Generator

Conv-Net (L2-loss)



GAN - Discriminator

Challenges

DCGAN model is difficult to train. Both discriminator and generator has to be tuned such that they are learning at the same pace. Convolution layers have to be designed carefully to avoid uneven colorization and patches. Both our baseline and GAN model takes around 50 minutes to train 1 epoch, which increase our difficulty to fine-tune. Memory overhead is high. Batch of 128 samples requires GPU memory of more than 12 GB.