Generative Adversarial Networks

To

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By

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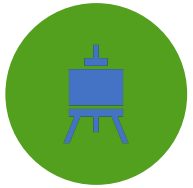
Introduction

• Generative • Learn a generative model

• Adversarial • Trained in an adversarial setting

• Networks • Use Deep Neural Networks

Applications of GAN

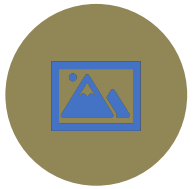


Create Anime characters

Pose Guided Person Image Generation

CycleGAN

Super resolution

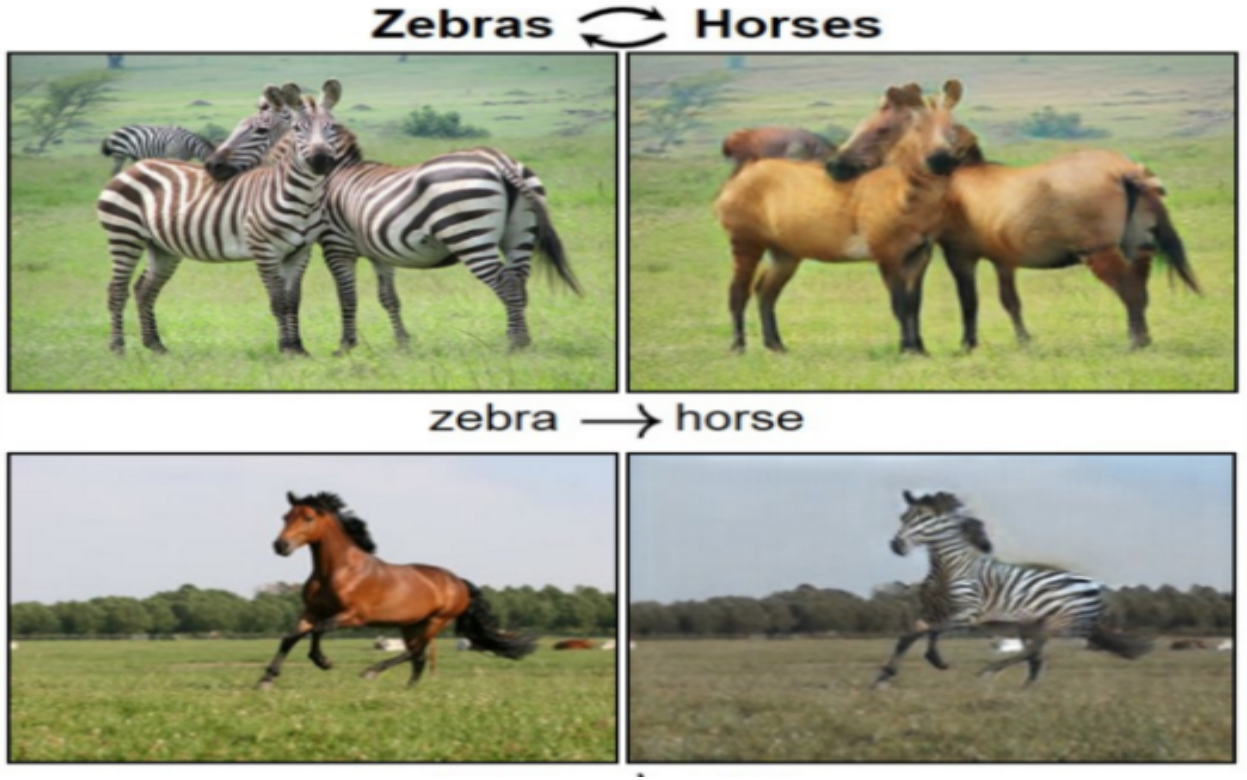


Text to image (StackGAN)

Create Anime Characters

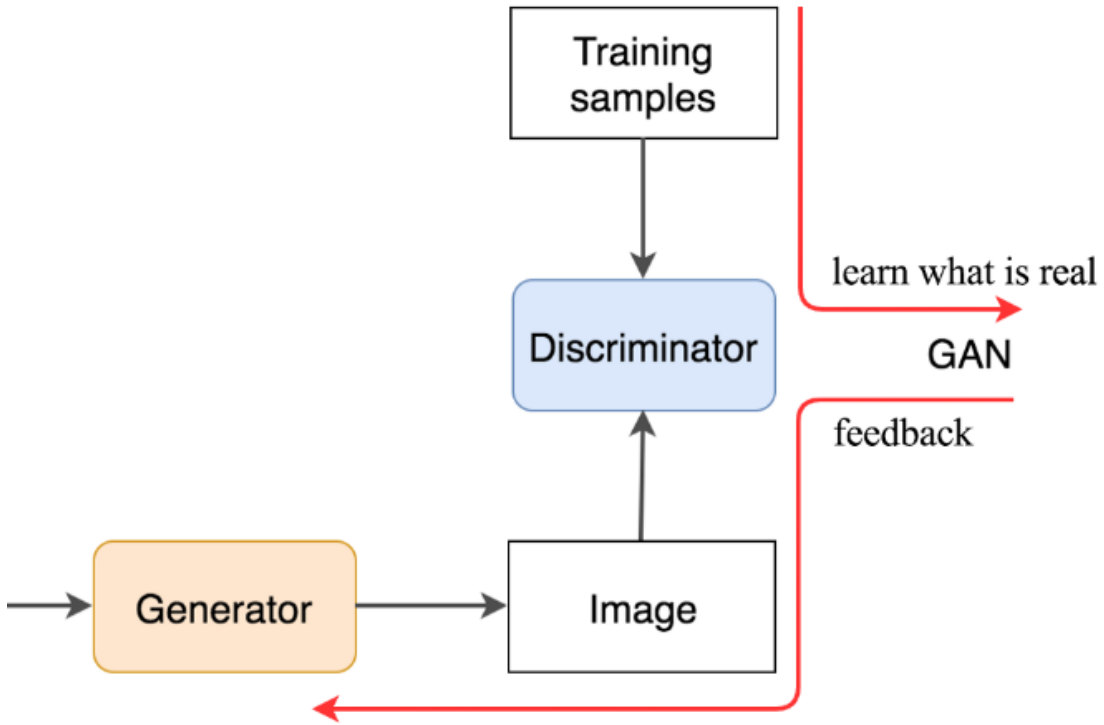
Pose Guided Person Image Generation

CycleGAN



Super Resolution

Proposed Model

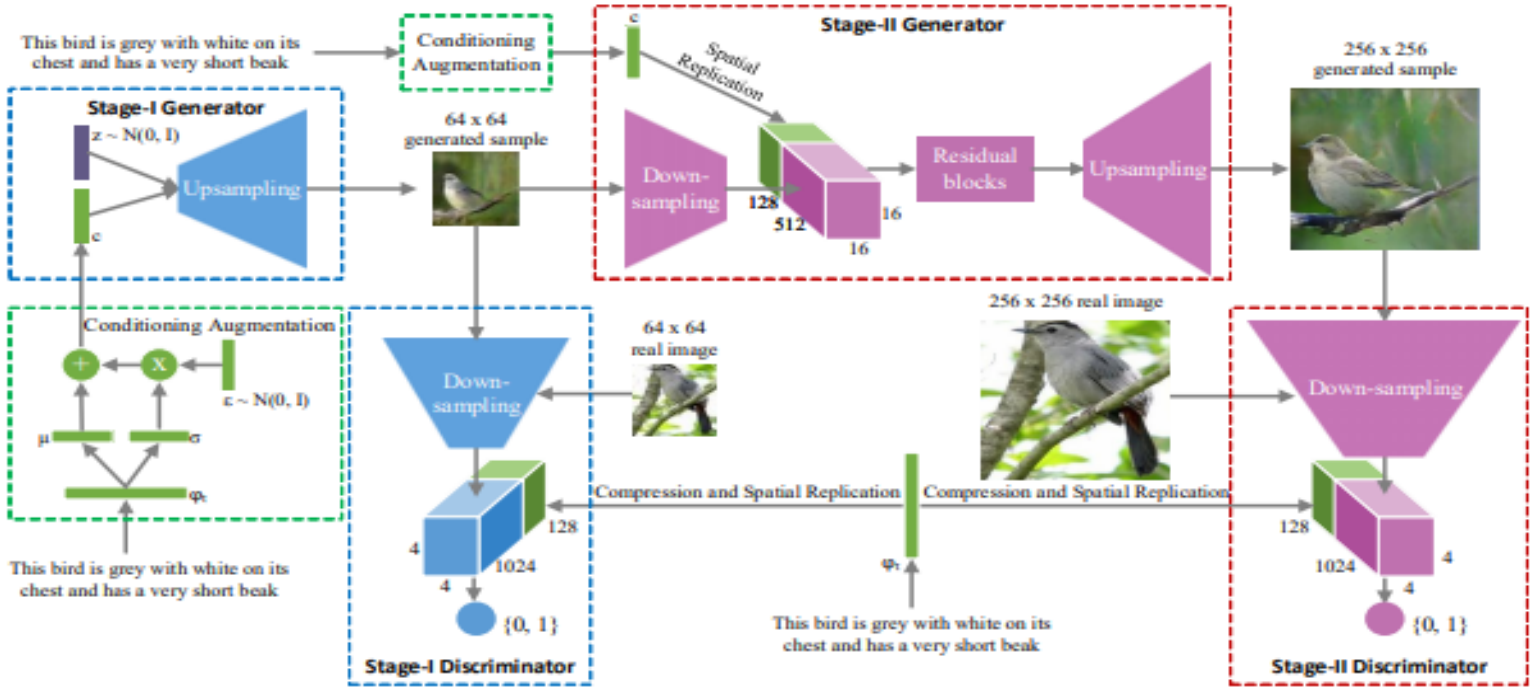


- Generator
- Discriminator

Working of Two-Stage GAN

- **- Stage-I GAN:** it sketches the primitive shape and basic colors of the object conditioned on the given text description and draws the background layout from a random noise vector, yielding a low-resolution image.
- - **Stage-II GAN:** it corrects defects in the low-resolution image and completes details of the object by reading the text description again, producing a high-resolution photo-realistic image.

Text to Image Synthesis Model Architecture



Feature Selection

Generating images based on detailed visual descriptions.

Manifold Interpolation regularize

Disentangling of style and content, and bird pose and background transfer from query images onto text descriptions.

In future work, we aim to further scale up the model to higher resolution images and add more types of text.

Datasets used:

Caltech-UCSD Birds dataset and the Oxford-102 Flowers

Results

A large bird has large thighs and large wings that have white wingbars

Stage-I images

Stage-II images

The small bird has a red head with feathers that fade from red to gray from head to tail

Stage-I images

Stage-II images

This bird sits close to the ground with his short yellow tarsus and feet; his bill is long and is also yellow and his color is mostly white with a black crown and primary feathers

Stage-I images

Stage-II images

Conclusion

Performed stacked Generative Adversarial Networks (StackGAN) for synthesizing photo-realistic images.

Decomposing the synthesis process into two more manageable stages

Extensive quantitative and qualitative results demonstrate the effectiveness of our proposed method.

Generates higher resolution images (e.g., 256 × 256) with more photo-realistic details.

THANK YOU