Text to Image Synthesis with StackGAN

Vision & Perception

SAPIENZA
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Proposal:

- Implementing a stacked GAN to decompose the hard problem into more manageable sub-problems.

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During training, the generator and discriminator compete against each other, leading to the improvement of both networks.

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- Different layers can focus on generating specific details, leading to fine-grained and realistic samples.
- It stabilize the training process, making it easier to train deep generative models.

About Implementation

model

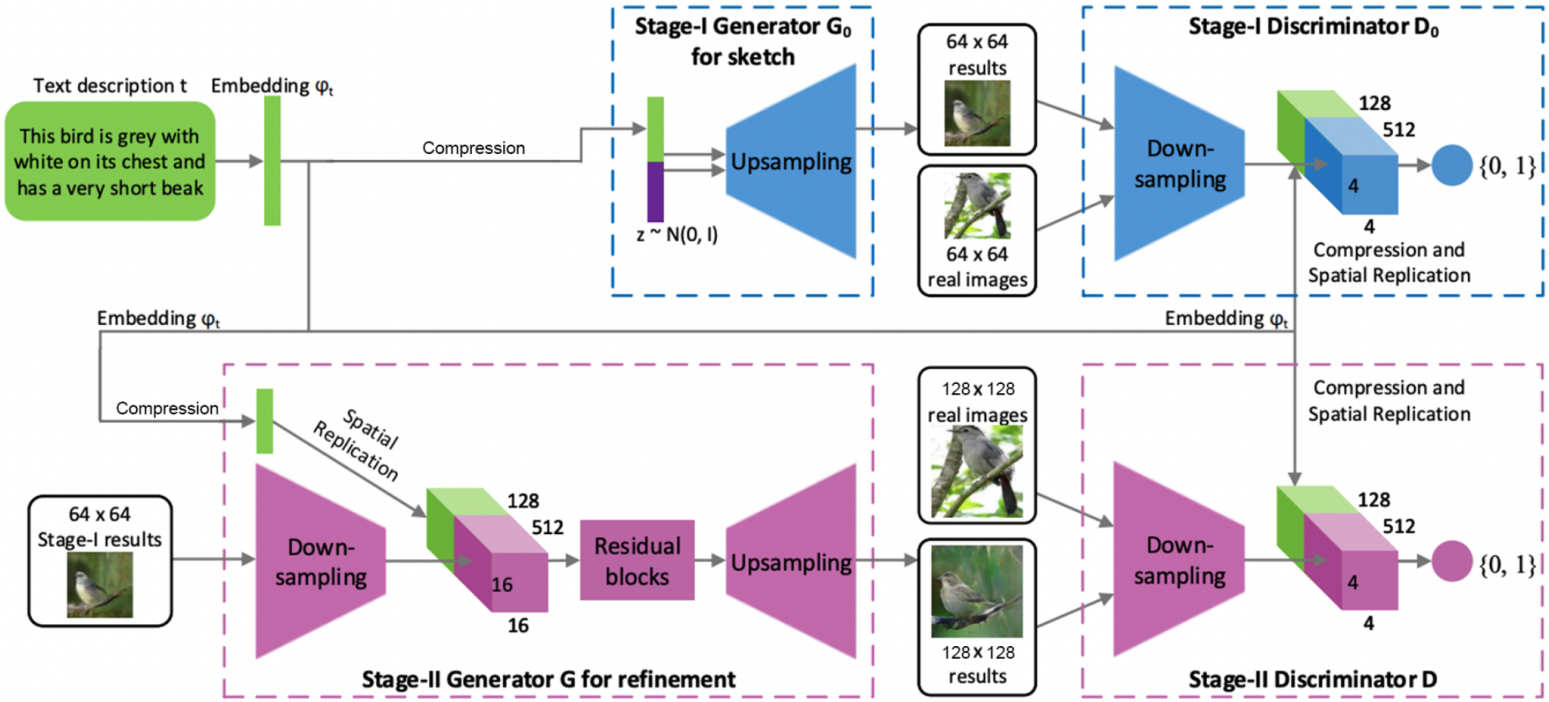

Figure: Model

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- We trained both GANs for 150 epochs with 64 batch size.

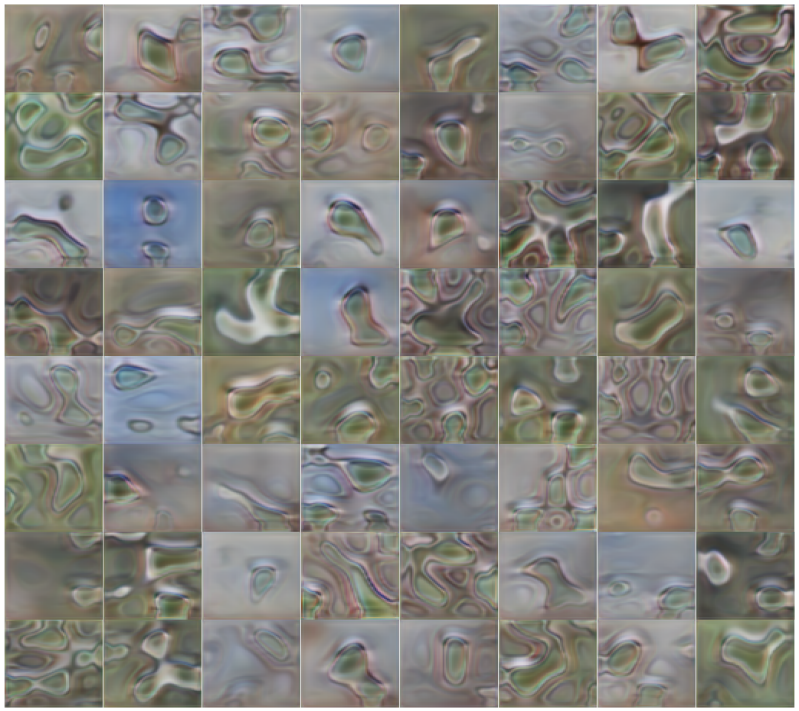
Loss during training

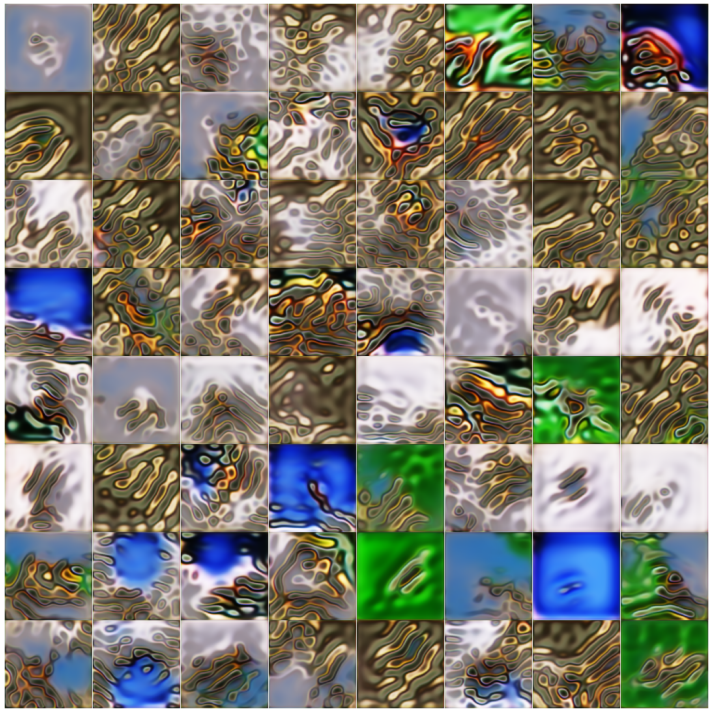
(a) first stack GAN.

(b) second stack GAN.

Figure: evolution of the losses during the training of the networks

Images during training





Generated image Examples

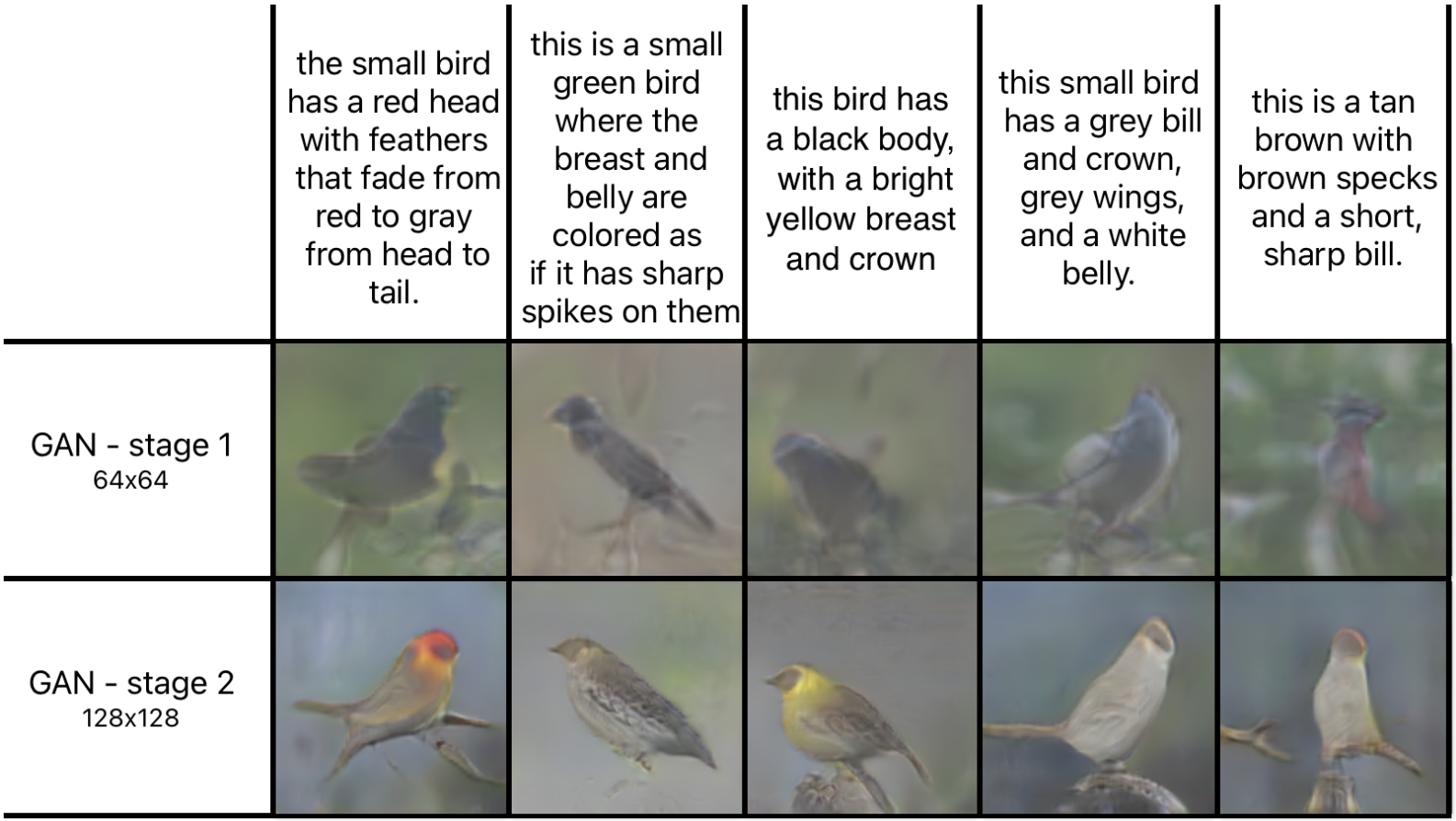


Figure: stackGAN results

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- We proposed a Stacked GAN for synthesizing 128x128 images from text;
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- We demonstrated that this architecture is effective for generating high-resolution images.

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- We proposed a Stacked GAN for synthesizing 128x128 images from text;
  - stack-GAN 1: sketches basic color and shape;
  - stack-GAN 2: corrects the defects and adds more details.
- We demonstrated that this architecture is effective for generating high-resolution images.
- This feature could be appreciated even more by modifying the network to generate higher resolution images (ex. 256x256).

Thank you for your attention