DL hw3 part2

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1 Task1

In terms of visual quality non-saturating GAN and hinge-loss GAN performs comparible while conditioned version of hinge-loss GAN works bad. Hinge-loss GAN best in terms of FID,IS scores, conditioned version is second one and non-satutaing GAN performs worse than others.

Figure 1: Non-saturating GAN

Figure 2: Hinge-loss GAN

Figure 3: Conditioned Hinge-loss GAN

	non-saturating	not conditioned(hinge-loss GAN)	conditioned(hinge-loss GAN)
FID	139.90	127.76	132.63
IS	2.51	2.94	2.89

Pictures below provided for similar but different setup (I change position of batch-normalization and convolution in discriminator head and turning off bias in generator convolutions). They lead to same conclusions about choosed versions performance.

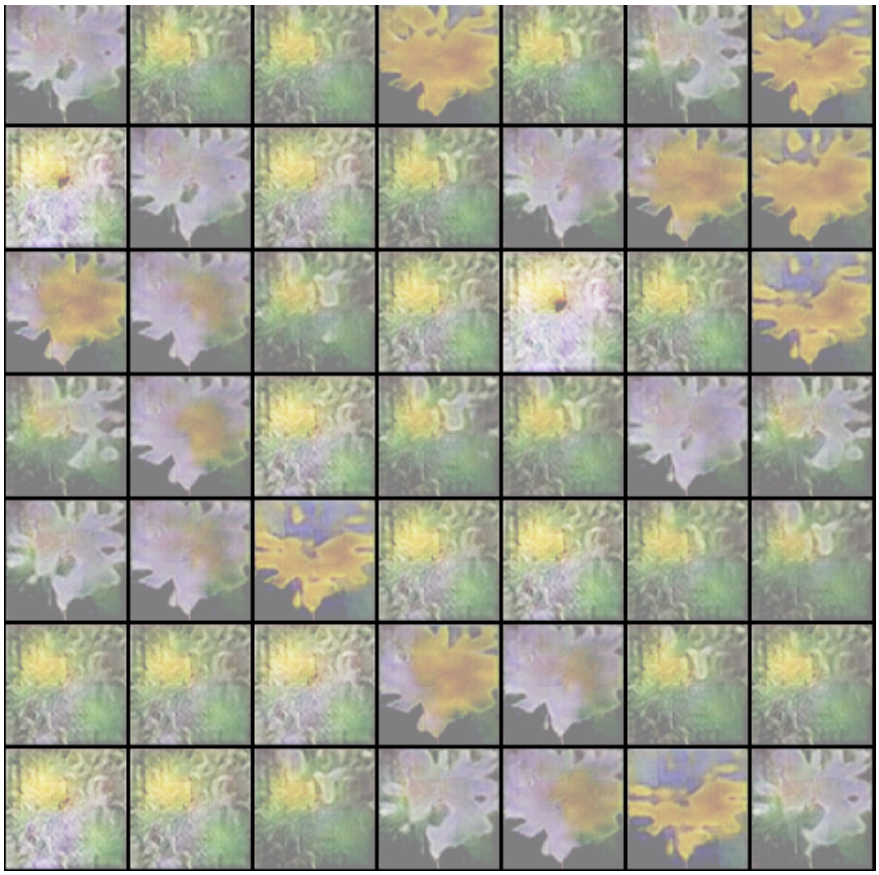

Figure 4: Non-saturating GAN

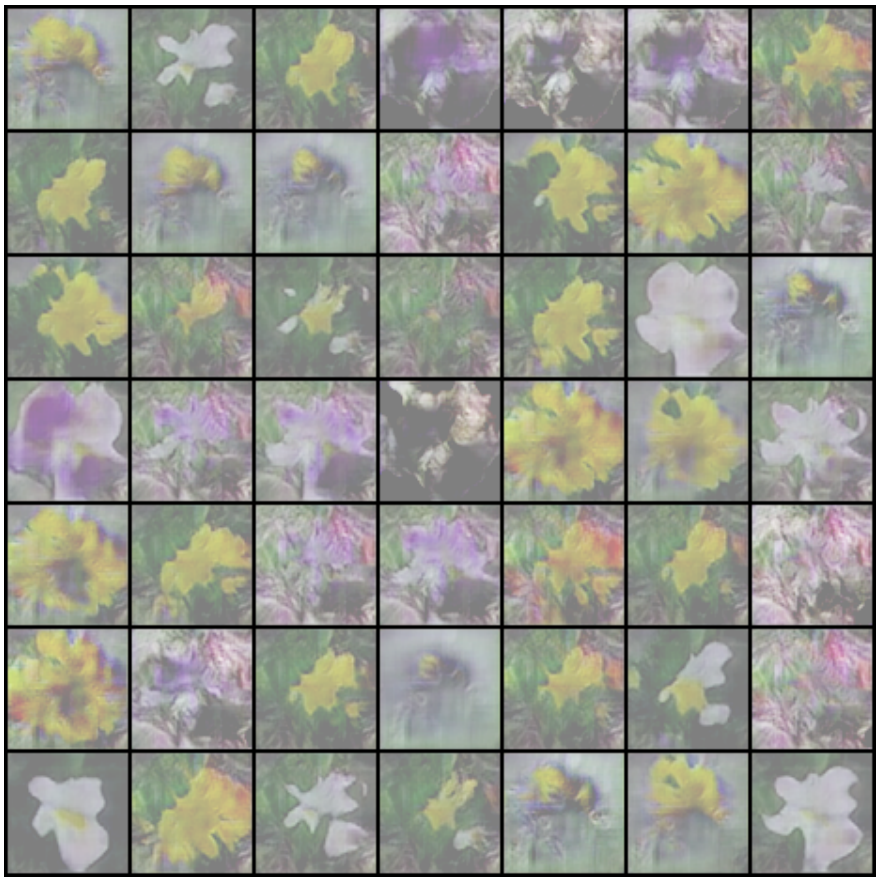

Figure 5: Hinge-loss GAN

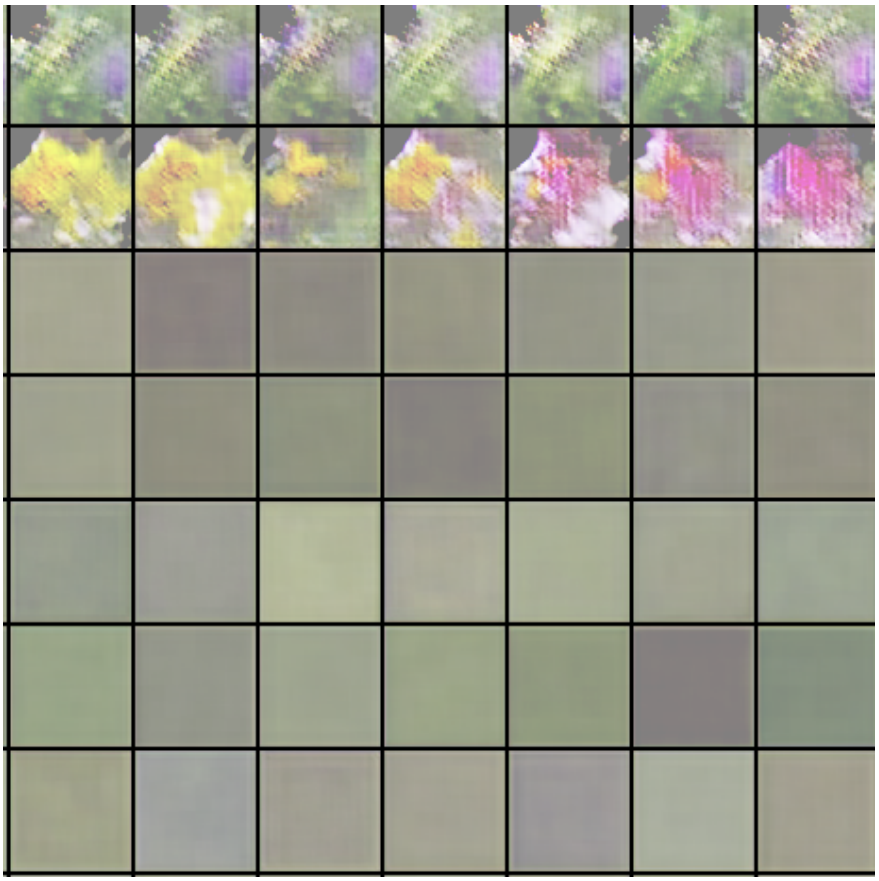

Figure 6: Conditioned Hinge-loss GAN

2 Task2

In original article no motivation provided to use class-conditioning for performance increasing and I don't see reasons for that; authors propose this technique as instrument to control image generation process (way to generate image from certain class). Class conditional model perform worse both in terms of FID,IS scores and visual quality. Pictures above show same result in visual quality.

	not conditioned(hinge-loss GAN)	conditioned(hinge-loss GAN)
FID	127.76	132.63
IS	2.94	2.89

Pictures below provided for similar but different setup (I change position of batch-normalization and convolution in discriminator head and turning off

bias in generator convolutions). I find out that both generator and discriminator conditioning work destructive and conditioning of generator more destructive than discriminator conditioning.

Figure 7: Hinge-loss GAN with conditioned generator

Figure 8: Hinge-loss GAN with conditioned discriminator

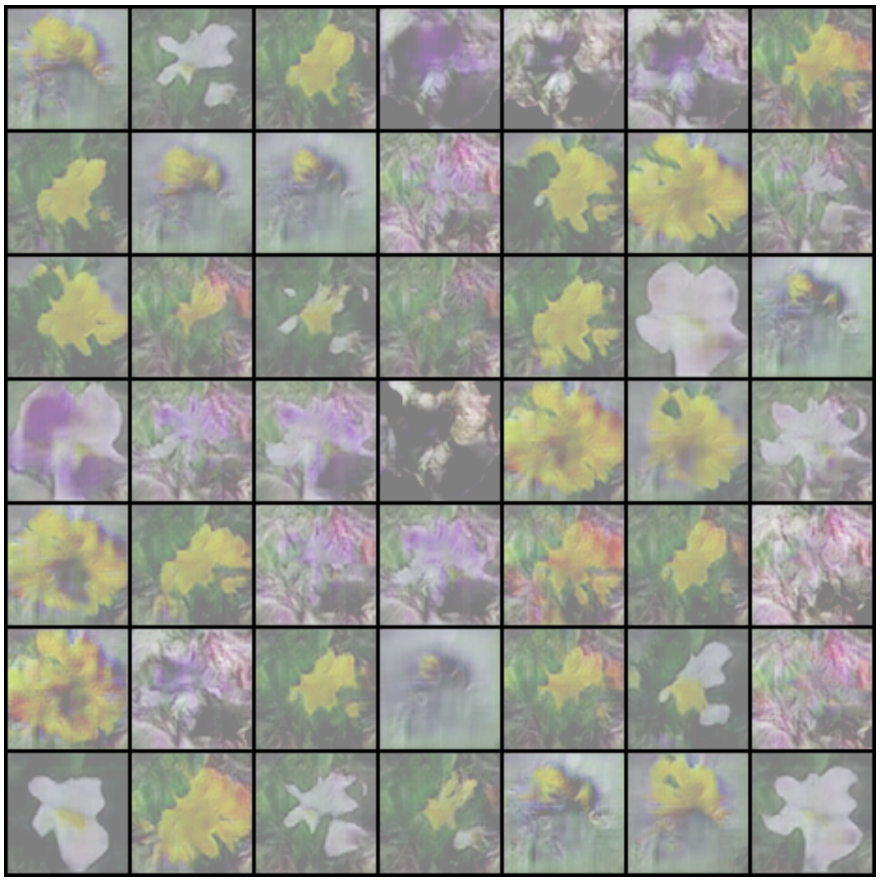

Figure 9: Non-conditioned Hinge-loss GAN

3 Task3

Truncation trick decrease metrics performance but visual quality still same. I was expecting increasing of performance, because during training generator see more frequently small values of noise(because choosed distribution is normal), so generator should produce better results for them.

	without truncation trick	with truncation trick
FID	132.63	143.88
IS	2.89	2.49

Figure 10: Conditioned Hinge-loss GAN without truncation trick

Figure 11: Conditioned Hinge-loss GAN with truncation trick