

Name: Yutong Xie

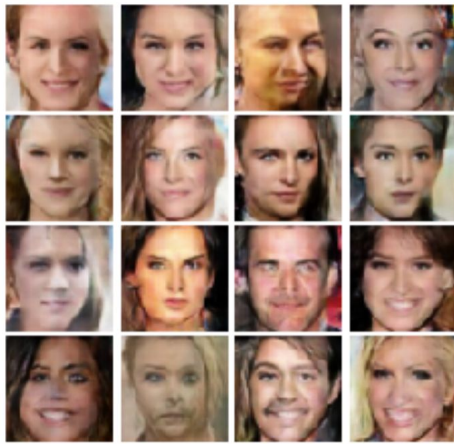
NetID: yutongx6

Team name on Kaggle leaderboard: Yutong Xie

Part 1:

Answer the following questions briefly (no more than a few sentences), and provide output images where requested.

Show final results from training both your GAN and LSGAN (give the final 4x4 grid of images for both):



Results for GAN



Results for LSGAN

Discuss any differences you observed in the quality of output or behavior during the training of the two GAN models.

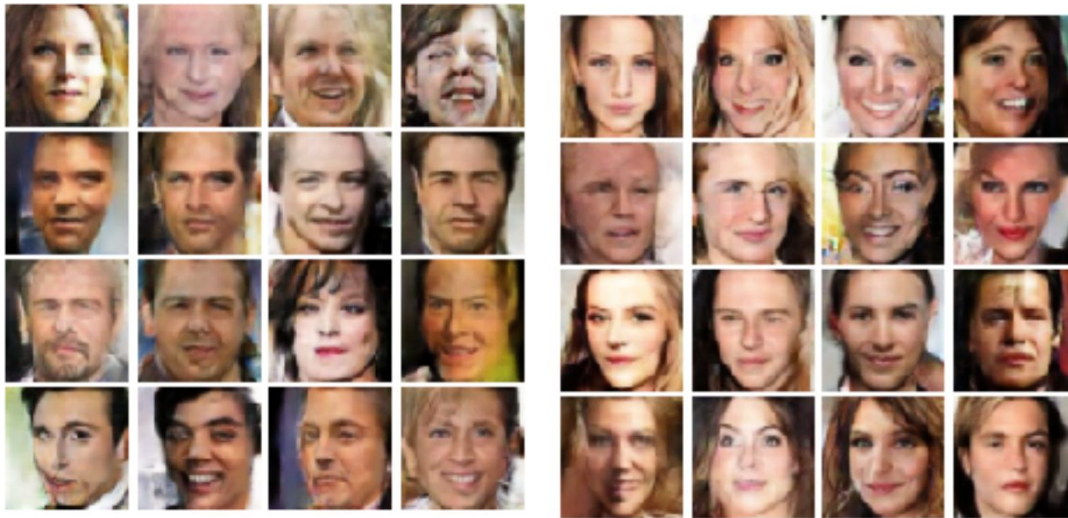
During the training process, GAN will achieve the acceptable performance using more epochs than LSGAN. From the final results, the images generated by LSGAN will be better than images generated by GAN.

Do you notice any instances of mode collapse in your GAN training (especially early in training)? Show some instances of mode collapse (if any) from your training output.

In the beginning of the training, the outputs of the model looked weird and blur.



Discuss briefly how/whether spectral normalization helps generate higher quality images in your implementation. Ideally, you should show samples from models with and without normalization.



The figures above show the results of image generation with (right) and without (left) normalization. From the figure, we can see that spectral normalization can provide higher quality images. Because spectral normalization can make discriminator satisfy Lipschitz restriction and then make the training process work normally.

Extra credit: If you completed the extra credit for this portion, explain what you did (describing all model changes and hyperparameter settings) and provide output images.

Part 2 (generation):

Give the hyperparameters for your best network on classification task below. Note any other changes you made to the base network in addition to the hyperparameters listed in the table below.

Hyperparameter	Value
RNN type:	LSTM
Number of layers:	2
Hidden layer size:	150
Learning rate:	0.01

I tried different hyperparameters combination and got the results. All the tests are under 2500 epochs training.

RNN type	Number of layers	Hidden layer size	Learning rate	Train loss	Test loss
LSTM	1	100	0.1	1.6129	1.6677
LSTM	1	100	0.01	1.4669	1.5844
LSTM	1	100	0.001	1.6005	1.6650
LSTM	1	50	0.01	1.8346	1.8375
LSTM	1	150	0.01	1.4167	1.5015
RNN	1	150	0.01	1.5692	1.6294
GRU	1	150	0.01	1.4480	1.5549
LSTM	2	150	0.01	1.2990	1.4454
LSTM	3	150	0.01	1.3516	1.4549

Give an example 1000 character output from your network:

They are as a bumble shrainton's to thee at my heart
Which let it enter and given a soldier, her man of your thousand chanis
A crown and honour and brack. My honour mock'd the
holy-a
sounded brings of men's searched broken would rememberness
From Actor's throats of the virtues before
And more than you were talk that seem to me,
Who took's men doth new lodges false and meant
That I am possible friented of a secreal,
That hath between your vow off, to hear it:
My lord, he be long and princesses,
The deed be your wish.

FRIAR LAURENCE:

What's bounted in the well-time and we'll eat, compare,
'Tis any you without bear and my bonnder say.

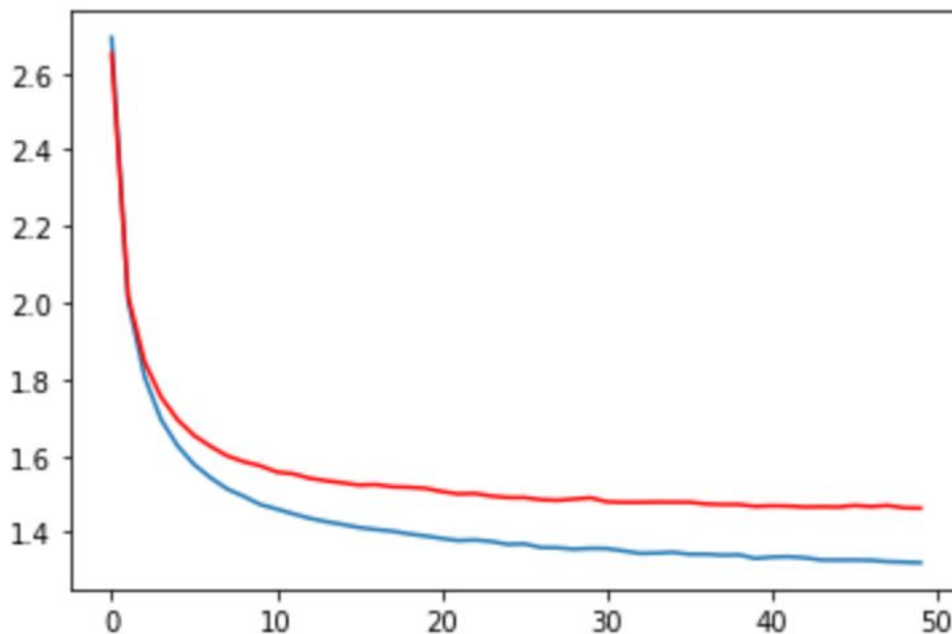
BEATRICE:

I will have perceive thee of the orator encounter.
I warrant her soul we not such present to-morrow
In a case of my mistress of a world it fill one.

HASTINGS:

He cannot neither so step for it by
As they say thou be very ten love, that am you
Concerns of consumers and place and modest
tunkest: on the soldier parts to Silvia,
What it is the king,

Insert the training & test loss plot from your RNN generation notebook below:



Extra credit: If you completed the extra credit for this portion, describe where your dataset came from, give an example from your training dataset (1000 characters), give an example output from your model trained on the dataset (1000 characters), and detail the hyperparameters you used to train a model on the dataset.

Part 2 (classification):

Give the hyperparameters for your best network on classification task below. Note any other changes you made to the base network in addition to the hyperparameters listed in the table below.

Hyperparameter	Value
RNN type:	LSTM
Number of layers:	2
Hidden layer size:	100
Learning rate:	0.001

You should reach the Kaggle accuracy benchmark with your Kaggle submission. Your notebook evaluation results should be similar to your performance on Kaggle. Insert the confusion matrix image outputted from your best model, and report the corresponding accuracy:

Test accuracy: 0.907

