Super Resolution

Network Architecture

I build 3-layered network for Super Resolution tasks(2x), 3x3 conv with ReLU as activation. (see **SuperResolutionNetwork** at `lib/network.py`)

Detail hyper parameter setup as below:

- Use Adam optimizer with `lr=.001` and `lr_decay=.0`.
- Use **Mean Squared Error** as loss
- Use PSNR as evaluation metric
- Initialize kernel(*random uniform*) and bias(*zeros*) in convolution layers.

Dataset

Use all `91` and `291` dataset. Create target image, random crop from image after random scale down and create source image using scale down and up by half.

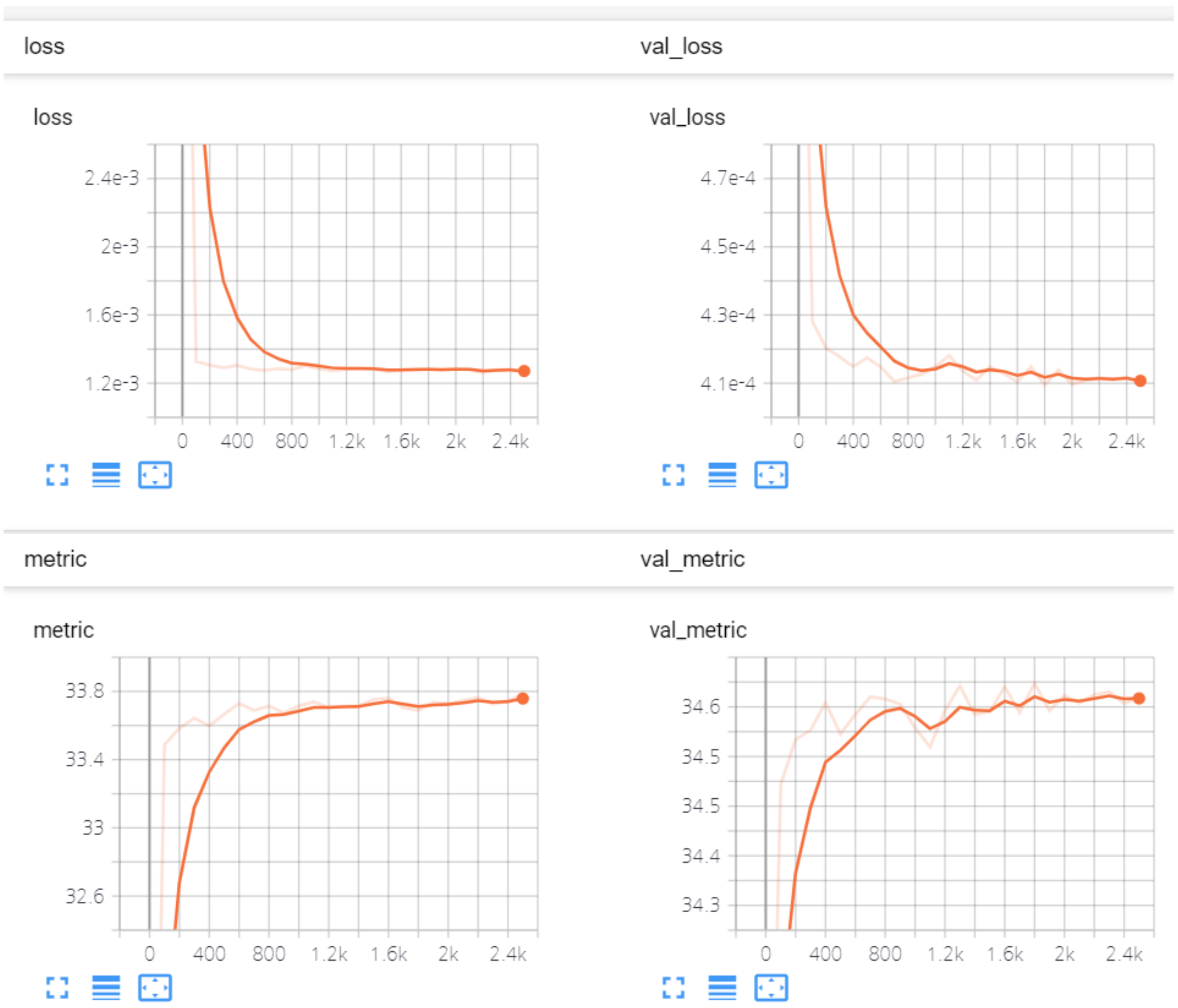
Evaluation

I use PSNR as evaluation metric, (see **SuperResolutionNetwork.metric** at `lib/network.py`) using TensorFlow implementation, `tf.image.psnr`.

Implement **Custom Callback** (see **CustomCallback** at `utils/callbacks.py`) for logging loss, accuracy and sample images. For each interval, write inferenced image summary for one train set and all test set.

Results

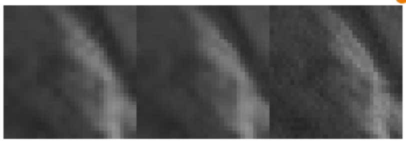
See `./assets` directory for results. Train, prediction and test image is merged for easy compare (re-scale image, prediction image, ground truth image).



This is some train samples for check train is running well.

train_0

train_0
step **2,500** Fri May 24 2019 12:22:21 GMT+0900 (한국 표준시)

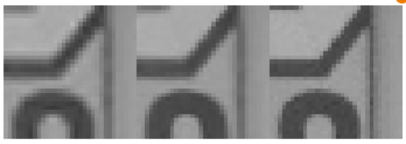


train_10

train_10
step **2,500** Fri May 24 2019 12:22:21 GMT+0900 (한국 표준시)

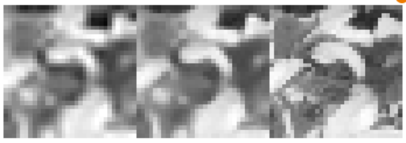
train_72

train_72
step **2,500** Fri May 24 2019 12:22:21 GMT+0900 (한국 표준시)



train_1

train_1
step **2,500** Fri May 24 2019 12:22:21 GMT+0900 (한국 표준시)

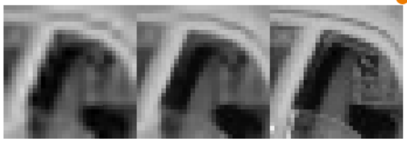


train_11

train_11
step **2,500** Fri May 24 2019 12:22:21 GMT+0900 (한국 표준시)

train_73

train_73
step **2,500** Fri May 24 2019 12:22:21 GMT+0900 (한국 표준시)



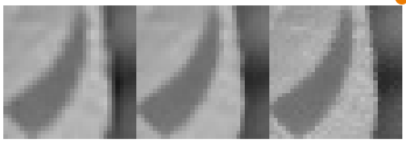
train_2

train_2
step **2,500** Fri May 24 2019 12:22:21 GMT+0900 (한국 표준시)

train_12

train_13

train_13
step **2,500** Fri May 24 2019 12:22:21 GMT+0900 (한국 표준시)



train_74

train_74
step **2,500** Fri May 24 2019 12:22:21 GMT+0900 (한국 표준시)