Super Resolution

Network Architecture

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

Detail hyper parameter setup as below:

- Use Adam optimizer with `lr=.001` and `lr_decay=.0`.
- Use **Mean Squared Error** as loss $\sum_{n=0}^{2}||y_{gt} - y_n||^2$
- Use PSNR as evaluation metric
- Create new vanilla RNN (`network/rnn.py`)

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

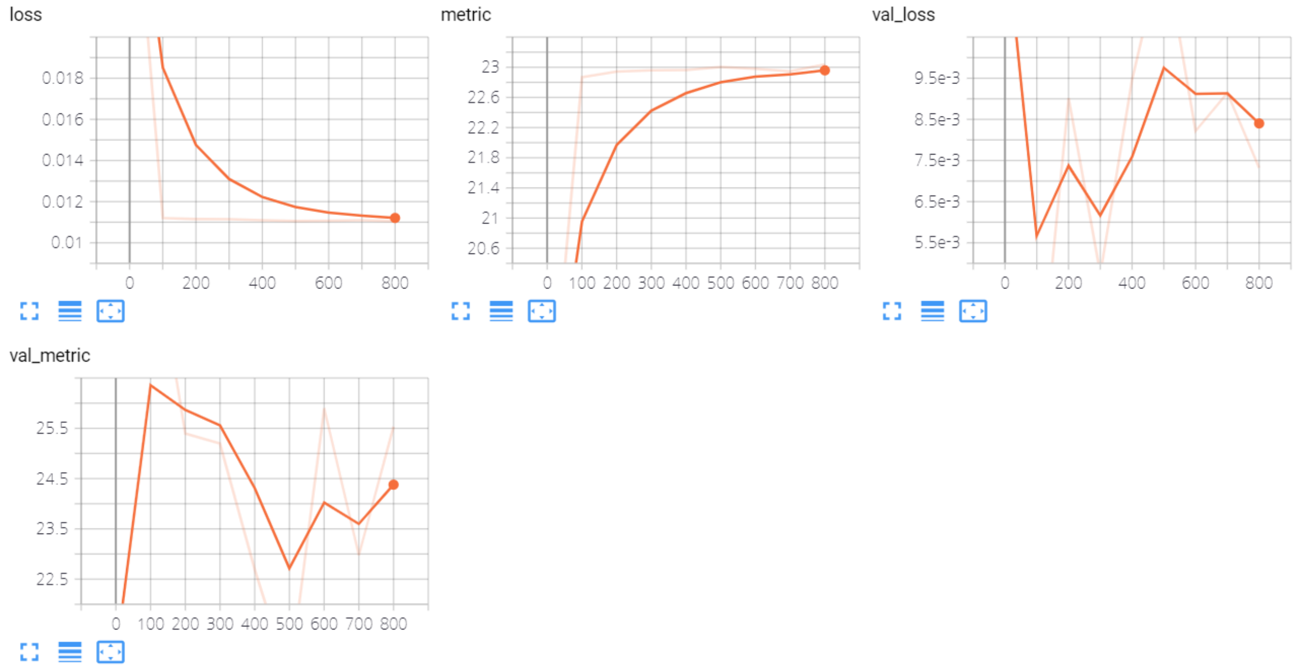
I use PSNR as evaluation metric, (see **SuperResolutionNetwork.metric** at `network/rnn.py`) using TensorFlow implementation, `tf.image.psnr`.

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.

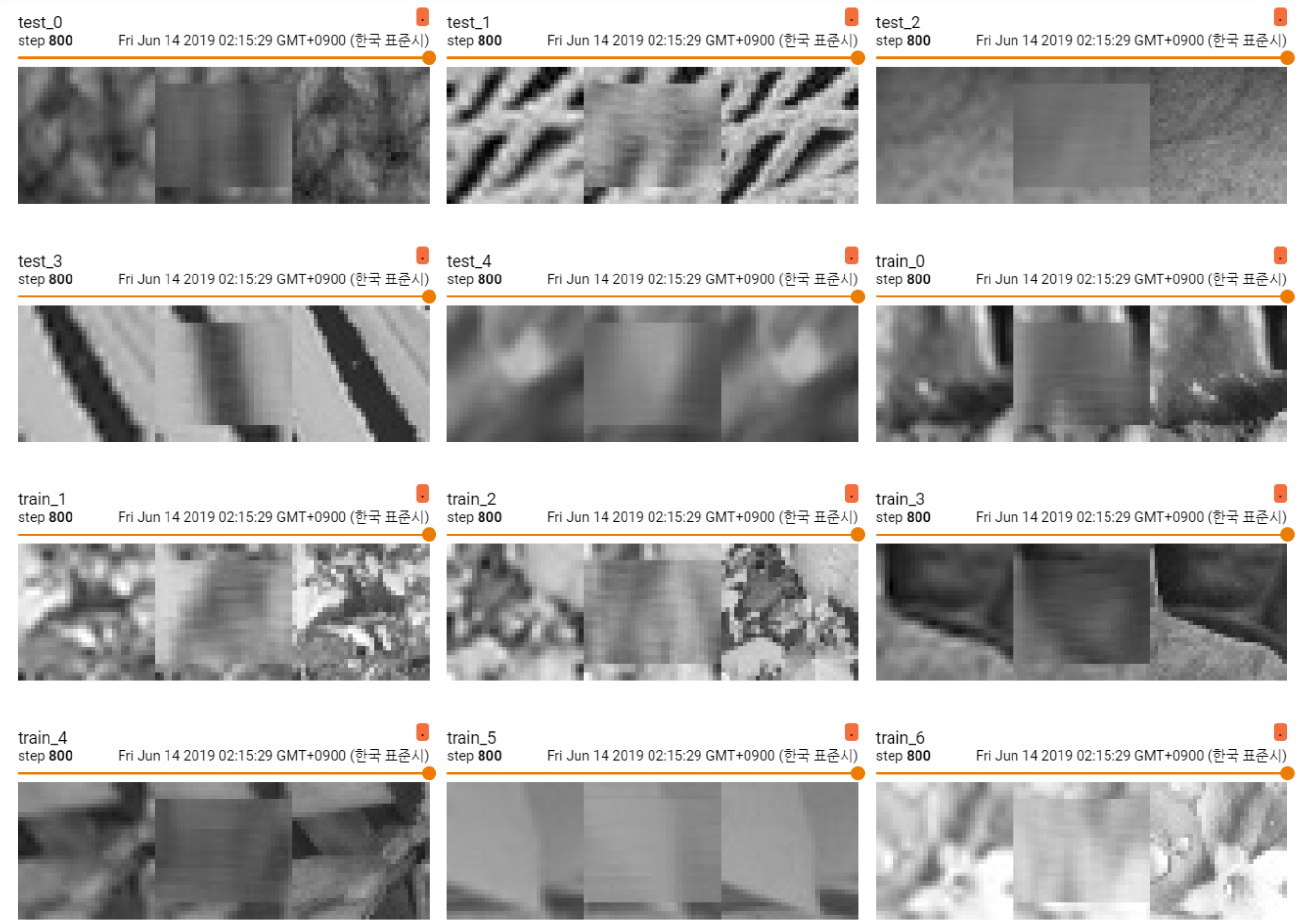
Results

In terms of time, it was only 1000 epoch. However, PSN and loss is saturated after 1000 epoch. Model parameters is saved on `model.hdf5` using keras model save method.

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.


test_0
step 800
Fri Jun 14 2019 02:15:29 GMT+0900 (한국 표준시)
test_1
step 800
Fri Jun 14 2019 02:15:29 GMT+0900 (한국 표준시)
test_2
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test_3
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test_4
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Fri Jun 14 2019 02:15:29 GMT+0900 (한국 표준시)
train_0
step 800
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train_1
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train_4
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train_5
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train_6
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