

Autoencoders

Advanced Machine Learning

April 18, 2018

In this task you will need to complete autoencoder model. View this lab as an exploration opportunity. You are provided with a template. The main file is `run.py`. Script automatically creates a folder `log` and stores execution statistics into it. This statistics can be later accessed through `tensorboard`.

Tasks for today:

1. Write a simple autoencoder model. You can use `tf.nn.sigmoid_cross_entropy_with_logits` as loss function. After completing the model, make sure the cost decreases. That would mean that everything is likely correct.
2. Launch `tensorboard --logdir=log` from your project folder
3. Explore `tensorboard`. Fig 1 shows the evolution of cost value over time. Fig 2 shows the `tensorboard` pane that can be used for visualizing generated images. Fig 3 shows `tensorboard` pane that displays computation graph of the current model. Fig 4 demonstrates `tensorboard` pane that can be used for embedding visualization. Additional references to documentation can be found in template source code.
4. Change your model. Use `tensorboard` to see how your results change:
 - (a) try different number of layers
 - (b) different size of latent space
 - (c) different activation functions of layers
 - (d) different losses

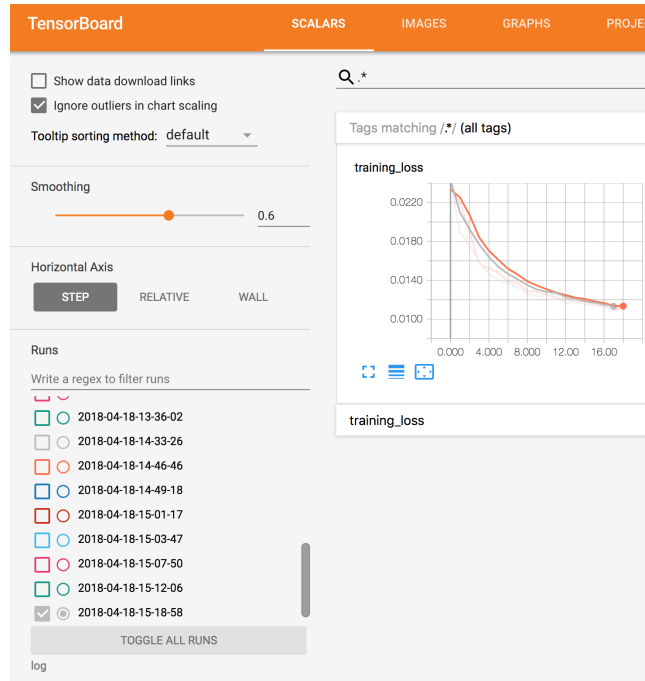


Figure 1: Learning

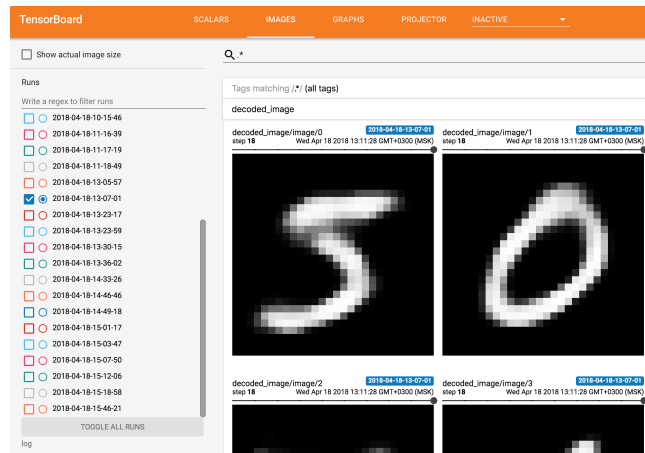


Figure 2: Decoded images

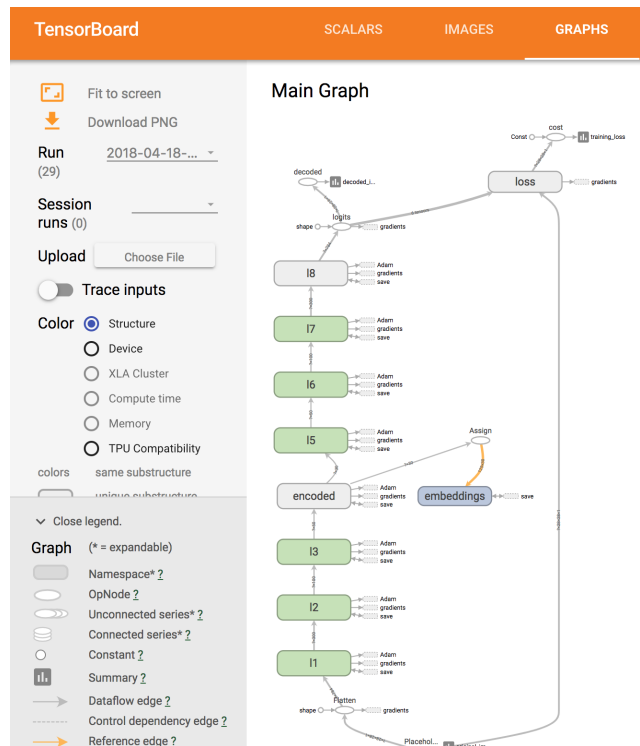


Figure 3: Graph visualization

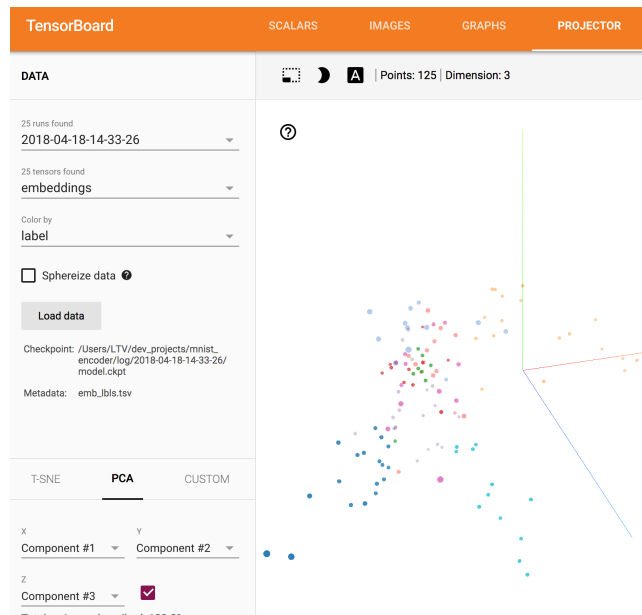


Figure 4: Embedding visualization