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In [1]: # Copyright 2017 Google, Inc. All Rights Reserved.
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# =====
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import os
import tensorflow as tf
import sys
import urllib

if sys.version_info[0] >= 3:
    from urllib.request import urlretrieve
else:
    from urllib import urlretrieve

LOGDIR = 'log3/'
GITHUB_URL = 'https://raw.githubusercontent.com/mamcgrath/TensorBoard-TF-Dev-Summit-Tutorial/master/'

### MNIST EMBEDDINGS ###
mnist = tf.contrib.learn.datasets.mnist.read_data_sets(train_dir=LOGDIR + 'data', one_hot=True)
### Get a sprite and labels file for the embedding projector ###
urlretrieve(GITHUB_URL + 'labels_1024.tsv', LOGDIR + 'labels_1024.tsv')
urlretrieve(GITHUB_URL + 'sprite_1024.png', LOGDIR + 'sprite_1024.png')

# Add convolution layer
def conv_layer(input, size_in, size_out, name="conv"):
    with tf.name_scope(name):
        #w = tf.Variable(tf.zeros([5, 5, size_in, size_out]), name="W")
        #b = tf.Variable(tf.zeros([size_out]), name="B")

        #1. changed W to 4x4 also size in and out hyperparameters are changed as per comment #2.
        w = tf.Variable(tf.truncated_normal([4, 4, size_in, size_out], stddev=0.1), name="W")
        b = tf.Variable(tf.constant(0.1, shape=[size_out]), name="B")

        # creates a 2D convolutional layer
        #Given an input tensor of shape [batch, in_height, in_width, in_channels] and a filter
        #kernel tensor of shape [filter_height, filter_width, in_channels, out_channels]
        #strides: A list of ints. 1-D of length 4. The stride of the sliding window for each dimension of input.
        #Must be in the same order as the dimension specified with format.
        #padding: A string from: "SAME", "VALID". The type of padding algorithm to use. Same preserves output's size
        #according to the input
        conv = tf.nn.conv2d(input, w, strides=[1, 1, 1, 1], padding="SAME")

        act = tf.nn.relu(conv + b)
        tf.summary.histogram("weights", w)

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        tf.summary.histogram("biases", b)
        tf.summary.histogram("activations", act)
        return tf.nn.max_pool(act, ksize=[1, 2, 2, 1], strides=[1, 2, 2, 1], padding="SAME")

# Add fully connected layer
def fc_layer(input, size_in, size_out, name="fc"):
    with tf.name_scope(name):
        w = tf.Variable(tf.truncated_normal([size_in, size_out], stddev=0.1),
            name="W")
        b = tf.Variable(tf.constant(0.1, shape=[size_out]), name="B")
        act = tf.nn.relu(tf.matmul(input, w) + b)
        tf.summary.histogram("weights", w)
        tf.summary.histogram("biases", b)
        tf.summary.histogram("activations", act)
        return act

def mnist_model(learning_rate, use_two_conv, use_two_fc, hparam):
    tf.reset_default_graph()
    sess = tf.Session()

    # Setup placeholders, and reshape the data. Nothing to be changed
    x = tf.placeholder(tf.float32, shape=[None, 784], name="x")
    x_image = tf.reshape(x, [-1, 28, 28, 1])
    tf.summary.image('input', x_image, 3)
    y = tf.placeholder(tf.float32, shape=[None, 10], name="labels")

    #2.changed conv layers sizes
    if use_two_conv:
        conv1 = conv_layer(x_image, 1, 25, "conv1")
        conv_out = conv_layer(conv1, 25, 50, "conv2")
    else:
        conv1 = conv_layer(x_image, 1, 50, "conv")
        conv_out = tf.nn.max_pool(conv1, ksize=[1, 2, 2, 1], strides=[1, 2, 2, 1],
            padding="SAME")

    flattened = tf.reshape(conv_out, [-1, 7 * 7 * 50])

    #3. Change fully connected layers
    if use_two_fc:
        fc1 = fc_layer(flattened, 7 * 7 * 50, 100, "fc1")
        embedding_input = fc1
        embedding_size = 100
        logits = fc_layer(fc1, 100, 10, "fc2")
    else:
        embedding_input = flattened
        embedding_size = 2450
        logits = fc_layer(flattened, 7*7*50, 10, "fc")

    with tf.name_scope("xent"):
        xent = tf.reduce_mean(
            tf.nn.softmax_cross_entropy_with_logits(
                logits=logits, labels=y), name="xent")

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tf.summary.scalar("xent", xent)

with tf.name_scope("train"):
    train_step = tf.train.AdamOptimizer(learning_rate).minimize(xent)

with tf.name_scope("accuracy"):
    correct_prediction = tf.equal(tf.argmax(logits, 1), tf.argmax(y, 1))
    accuracy = tf.reduce_mean(tf.cast(correct_prediction, tf.float32))
    tf.summary.scalar("accuracy", accuracy)

summ = tf.summary.merge_all()

embedding = tf.Variable(tf.zeros([1024, embedding_size]), name="test_embedding")
assignment = embedding.assign(embedding_input)
saver = tf.train.Saver()

sess.run(tf.global_variables_initializer())
writer = tf.summary.FileWriter(LOGDIR + hparam)
writer.add_graph(sess.graph)

config = tf.contrib.tensorboard.plugins.projector.ProjectorConfig()
embedding_config = config.embeddings.add()
embedding_config.tensor_name = embedding.name
embedding_config.sprite.image_path = LOGDIR + 'sprite_1024.png'
embedding_config.metadata_path = LOGDIR + 'labels_1024.tsv'
# Specify the width and height of a single thumbnail.
embedding_config.sprite.single_image_dim.extend([28, 28])
tf.contrib.tensorboard.plugins.projector.visualize_embeddings(writer, config)

for i in range(2001):
    batch = mnist.train.next_batch(100)
    if i % 5 == 0:
        [train_accuracy, s] = sess.run([accuracy, summ], feed_dict={x: batch[0], y: batch[1]})
        writer.add_summary(s, i)
        print str(i) + ". train acc:", train_accuracy
    if i % 500 == 0:
        sess.run(assignment, feed_dict={x: mnist.test.images[:1024], y: mnist.test.labels[:1024]})
        saver.save(sess, os.path.join(LOGDIR, "model.ckpt"), i)
        sess.run(train_step, feed_dict={x: batch[0], y: batch[1]})
def make_hparam_string(learning_rate, use_two_fc, use_two_conv):
    conv_param = "conv2" if use_two_conv else "conv1"
    fc_param = "fc2" if use_two_fc else "fc1"
    return "lr_%.0E%s%s" % (learning_rate, conv_param, fc_param)

def main():
    # You can try adding some more Learning rates
    #for learning_rate in [1E-3, 1E-4, 1E-5]:
    for learning_rate in [1E-5]:

        # Include "False" as a value to try different model architectures
        #for use_two_fc in [True, False]:

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for use_two_fc in [False]:
    #for use_two_conv in [True, False]:
    for use_two_conv in [False]:
        # Construct a hyperparameter string for each one (example: "lr_1E-3fc2
conv2")
        hparam = make_hparam_string(learning_rate, use_two_fc, use_two_conv)
        print('Starting run for %s' % hparam)
        sys.stdout.flush() # this forces print-ed lines to show up.

        # Actually run with the new settings
        print "learning_rate", learning_rate
        print "use_two_fc", use_two_fc
        print "use_two_conv", use_two_conv
        mnist_model(learning_rate, use_two_fc, use_two_conv, hparam)

if __name__ == '__main__':
    main()

print "Done"

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Extracting log3/data/train-images-idx3-ubyte.gz
Extracting log3/data/train-labels-idx1-ubyte.gz
Extracting log3/data/t10k-images-idx3-ubyte.gz
Extracting log3/data/t10k-labels-idx1-ubyte.gz
Starting run for lr_1E-05conv1fc1
learning_rate 1e-05
use_two_fc False
use_two_conv False
0. train acc: 0.17
5. train acc: 0.11
10. train acc: 0.1
15. train acc: 0.07
20. train acc: 0.14
25. train acc: 0.08
30. train acc: 0.16
35. train acc: 0.07
40. train acc: 0.14
45. train acc: 0.09
50. train acc: 0.13
55. train acc: 0.1
60. train acc: 0.17
65. train acc: 0.13
70. train acc: 0.08
75. train acc: 0.16
80. train acc: 0.15
85. train acc: 0.14
90. train acc: 0.17
95. train acc: 0.11
100. train acc: 0.19
105. train acc: 0.24
110. train acc: 0.15
115. train acc: 0.17
120. train acc: 0.22
125. train acc: 0.15
130. train acc: 0.17
135. train acc: 0.22
140. train acc: 0.16
145. train acc: 0.18
150. train acc: 0.19
155. train acc: 0.19
160. train acc: 0.26
165. train acc: 0.2
170. train acc: 0.2
175. train acc: 0.14
180. train acc: 0.22
185. train acc: 0.18
190. train acc: 0.12
195. train acc: 0.18
200. train acc: 0.16
205. train acc: 0.21
210. train acc: 0.17
215. train acc: 0.18
220. train acc: 0.22
225. train acc: 0.25
230. train acc: 0.22
235. train acc: 0.2
240. train acc: 0.21
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245. train acc: 0.26
250. train acc: 0.16
255. train acc: 0.19
260. train acc: 0.22
265. train acc: 0.22
270. train acc: 0.2
275. train acc: 0.24
280. train acc: 0.23
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290. train acc: 0.29
295. train acc: 0.26
300. train acc: 0.28
305. train acc: 0.3
310. train acc: 0.21
315. train acc: 0.3
320. train acc: 0.2
325. train acc: 0.19
330. train acc: 0.19
335. train acc: 0.3
340. train acc: 0.28
345. train acc: 0.19
350. train acc: 0.28
355. train acc: 0.21
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445. train acc: 0.24
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460. train acc: 0.22
465. train acc: 0.19
470. train acc: 0.32
475. train acc: 0.25
480. train acc: 0.27
485. train acc: 0.25
490. train acc: 0.22
495. train acc: 0.2
500. train acc: 0.27
505. train acc: 0.31
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530. train acc: 0.32
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680. train acc: 0.25
685. train acc: 0.18
690. train acc: 0.3
695. train acc: 0.34
700. train acc: 0.3
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710. train acc: 0.28
715. train acc: 0.32
720. train acc: 0.27
725. train acc: 0.3
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735. train acc: 0.23
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745. train acc: 0.32
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755. train acc: 0.32
760. train acc: 0.24
765. train acc: 0.29
770. train acc: 0.31
775. train acc: 0.38
780. train acc: 0.3
785. train acc: 0.37
790. train acc: 0.32
795. train acc: 0.28
800. train acc: 0.26
805. train acc: 0.3
810. train acc: 0.24

815. train acc: 0.25
820. train acc: 0.38
825. train acc: 0.31
830. train acc: 0.28
835. train acc: 0.32
840. train acc: 0.32
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860. train acc: 0.21
865. train acc: 0.29
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880. train acc: 0.34
885. train acc: 0.32
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1010. train acc: 0.32
1015. train acc: 0.32
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1950. train acc: 0.28

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1975. train acc: 0.35
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1985. train acc: 0.28
1990. train acc: 0.32
1995. train acc: 0.47
2000. train acc: 0.34
Done
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In []:

In []: