caffe (/github/BVLC/caffe/tree/master) / examples (/github/BVLC/caffe/tree/master/examples) / siamese (/github/BVLC/caffe/tree/master/examples/siamese)

Setup

Import Caffe and the usual modules.

In [1]:

```
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline

# Make sure that caffe is on the python path:
caffe_root = '../../'  # this file is expected to be in {caffe_root}/examples/siamese
import sys
sys.path.insert(0, caffe_root + 'python')

import caffe
```

Load the trained net

Load the model definition and weights and set to CPU mode TEST phase computation with input scaling.

In [2]:

```
MODEL_FILE = 'mnist_siamese.prototxt'
# decrease if you want to preview during training
PRETRAINED_FILE = 'mnist_siamese_iter_50000.caffemodel'
caffe.set_mode_cpu()
net = caffe.Net(MODEL_FILE, PRETRAINED_FILE, caffe.TEST)
```

Load some MNIST test data

In [3]:

```
TEST_DATA_FILE = '../../data/mnist/t10k-images-idx3-ubyte'
TEST_LABEL_FILE = '../../data/mnist/t10k-labels-idx1-ubyte'
n = 10000

with open(TEST_DATA_FILE, 'rb') as f:
    f.read(16) # skip the header
    raw_data = np.fromstring(f.read(n * 28*28), dtype=np.uint8)

with open(TEST_LABEL_FILE, 'rb') as f:
    f.read(8) # skip the header
    labels = np.fromstring(f.read(n), dtype=np.uint8)
```

Generate the Siamese features

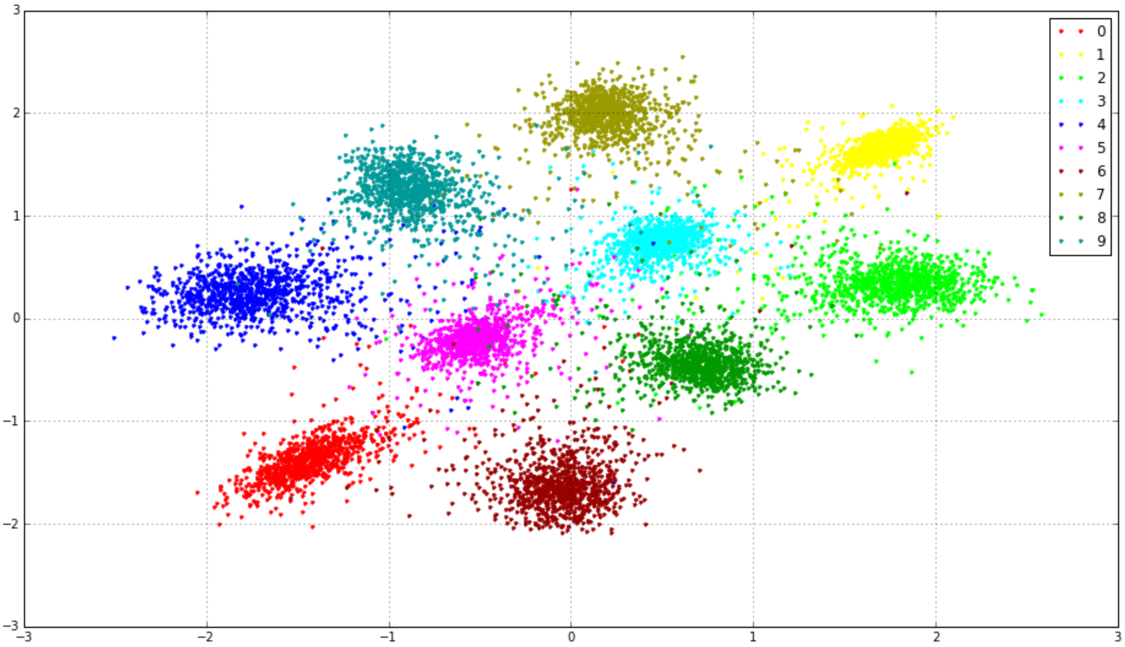
In [4]:

```
# reshape and preprocess
caffe_in = raw_data.reshape(n, 1, 28, 28) * 0.00390625 # manually scale data instead of
using `caffe.io.Transformer`
out = net.forward_all(data=caffe_in)
```

Visualize the learned Siamese embedding

In [5]:

```
feat = out['feat']
f = plt.figure(figsize=(16,9))
c = ['#ff0000', '#ffff00', '#00ff00', '#00ffff', '#0000ff',
     '#ff00ff', '#990000', '#999900', '#009900', '#009999']
for i in range(10):
    plt.plot(feat[labels==i,0].flatten(), feat[labels==i,1].flatten(), '.', c=c[i])
plt.legend(['0', '1', '2', '3', '4', '5', '6', '7', '8', '9'])
plt.grid()
plt.show()
```


3
2
1
0
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1
2
3
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1
2
3
4
5
6
7
8
9