Progress Update

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Train and test

- Use Theo' s algorithm, which deals with each set separately.

- File structure:
  - **$SET_DIR**: the input directory of the algorithm, has subdirectories set0 (for test), set1, set2, set3, set4. Images in text files of corresponding set are stored here.
  - **$RUN_DIR**: the output directory of the algorithm. The checkpoint files of four networks and test results are written here.

Train and test

```
[gpc-f102n004-ib0-$ python SKalgorithm.py -i $SET_DIR -o $RUN_DIR -t 1 -n 300
20: Cost 0.235023796186, Accuracy 0.83599999547
40: Cost 0.0541482770932, Accuracy 0.963999995589
60: Cost 0.0405144736636, Accuracy 0.974000003934
80: Cost 0.0307019122818, Accuracy 0.979999998212
100: Cost 0.0322201041388, Accuracy 0.983000004292
120: Cost 0.0309228528407, Accuracy 0.982000002265
140: Cost 0.00953198821226, Accuracy 0.996000003815
160: Cost 0.0123060081765, Accuracy 0.99300000715
180: Cost 0.0100914791416, Accuracy 0.996000003815
200: Cost 0.00966936125042, Accuracy 0.996000003815
220: Cost 0.00956708768645, Accuracy 0.995000004768
240: Cost 0.0196097822394, Accuracy 0.988000002503
260: Cost 0.0106482188363, Accuracy 0.992999997735
280: Cost 0.00864690441522, Accuracy 0.994000005722
300: Cost 0.0104775268876, Accuracy 0.995000004768
gpc-f102n004-ib0-$ 

[gpc-f102n004-ib0-$ python SKalgorithm.py -i $SET_DIR -o $RUN_DIR -t 0
Testing: Accuracy 0.972999989986
```

Train and test

- Results

	set0	set1	set2	set3	set4
image number	6827	15681	2626	1441	647
train accuracy		0.995	0.980	0.900	0.860
test accuracy	0.973				

Look at the trained network

- I modified inference() to output weight variables as well as logits, and write the filters in to TGraph2D after training.

- The network is made up of 1 convolutional layer followed by pooling and 2 fully connected layers. The convolutional layer has 22 filters of size 5*5.

- 16 of them are angle filters and the remaining 8 are custom filters of rotational symmetry. Half the filters are for muons and half for electrons