Deep learning seminar

August 29, 2019

1 Paper discussion

Learning Structured Sparsity in Deep Neural Networks

- why
  1. reduce computational cost
  2. speed up and acceleration
- how
  1. non-structured sparse regularization
     (a) sparsity regularization/ connection pruning
     cons: produce non-structured random connectivity and no acceleration
     (b) low rank approximation
     cons: the structures of the layers are fixed during fine-tuning such that costly reiterations of decomposing and fine-tuning are required
  2. structured sparse regularization
- inspiration
  1. redundancy across filters and channels
  2. shapes of filters are usually fixed
  3. depth of the network is critical
- propose Structured Sparsity Learning (SSL) method to adaptively adjust mutiple structures in DNN

2 Our sparse training result

Table 1: Accuracy and sparsity record

Iteration number	SGD		l1-prox	
	accuracy(%)	sparsity(%)	accuracy(%)	sparsity(%)
1	93.03	0	93.10	38.34
2	93.81	38.34	93.82	56.71
3	94.25	56.71	94.47	70.59
4	94.68	70.59	94.80	75.51
5	94.86	75.51	94.84	76.27
6	94.88	76.27	94.84	68.83

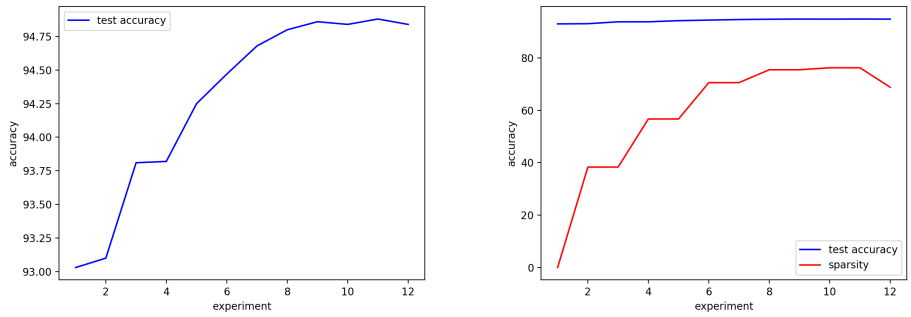

Figure 1: Results