MP.PB.2

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基于多损失感知的神经网络通道剪枝方法

Multi-Loss-Aware Channel Pruning of Deep Networks

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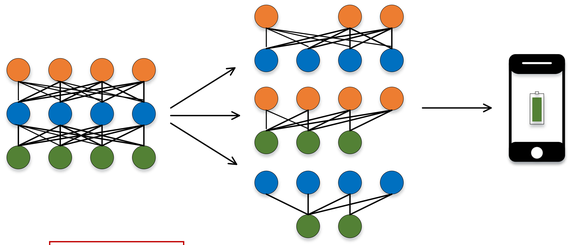
CASIA

Background



Objective

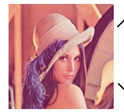
Accelerate the existing neural networks by pruning for efficient deployment.

Multi-Loss-Aware Channel Pruning Algorithm

Train a large model from scratch

Select the most important channels based on the final loss

Fine-tune pruned Network



Baseline Model

Pruned Model

Feature Maps

Before Pruning:

After Pruning:

Reconstruction Error

Feature & Semantic Correlation Loss

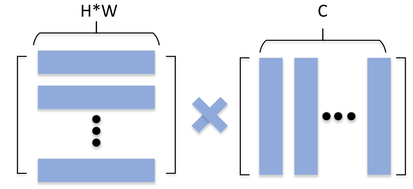
Classification Loss

⊕ Final Loss

Convolution Fully connected

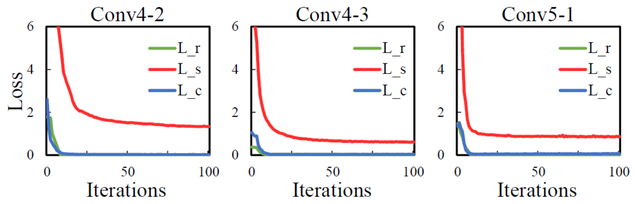
Max pooling Softmax

Feature Correlation



Semantic Correlation

Experimental Result



Methods	Training Err. (%)	Test Err. (%)
$\mathcal{L}_r$	3.75	9.74
$\mathcal{L}_s$	6.53	10.95
$\mathcal{L}_c$	0.85	8.35
$\mathcal{L}_r + \mathcal{L}_s$	1.31	8.27
$\mathcal{L}_r + \mathcal{L}_c$	0.73	8.14
$\mathcal{L}_s + \mathcal{L}_c$	1.03	8.20
$\mathcal{L}_r + \mathcal{L}_s + \mathcal{L}_c$	1.09	8.00

Models	Methods	Baseline(%)	Err. Gap(%)	#Param.	#Param↓	#Flops	#Flops↓
VGG	CP	6.01	+0.32	7.70M	1.92×	155.80M	2.00×
	ThiNet		+0.14				
	Slimming		+0.19				
	DCP		-0.17				
	Ours	6.08	**-0.13**	5.50M	2.26×	140.30M	2.23×
ResNet56	CP	6.20	+1.00	0.42M	1.97×	63.20M	1.99×
	ThiNet		+0.82				
	WM		+0.56				
	DCP		+0.31				
	Ours	6.26	**-0.24**				