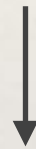# Dilated Residual Networks

崔金娜

2018. 5. 2

Convolutional Networks

Convolutional layer + Pooling layer
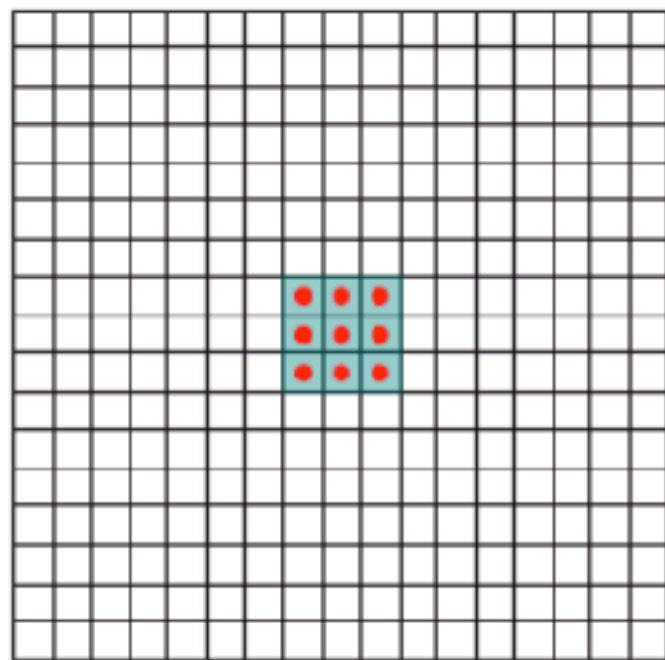
↓

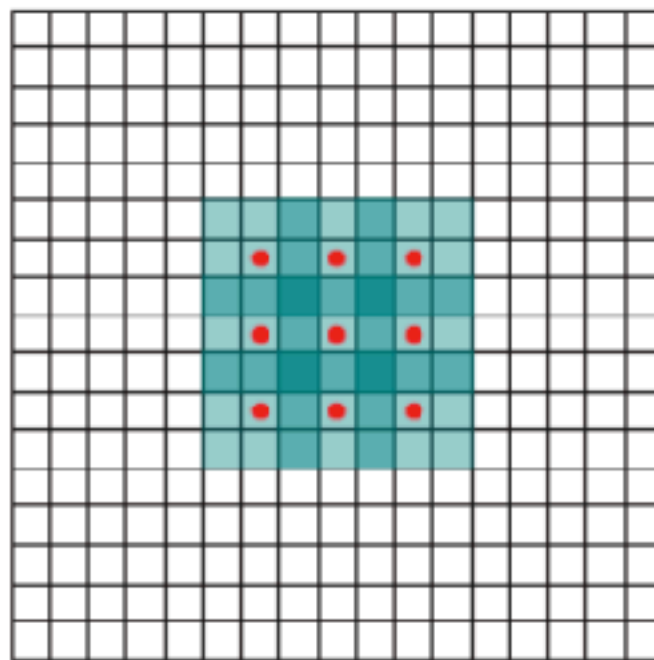图像精度降低，像素间联系被忽略

↓

分类准确率降低，分类效果差

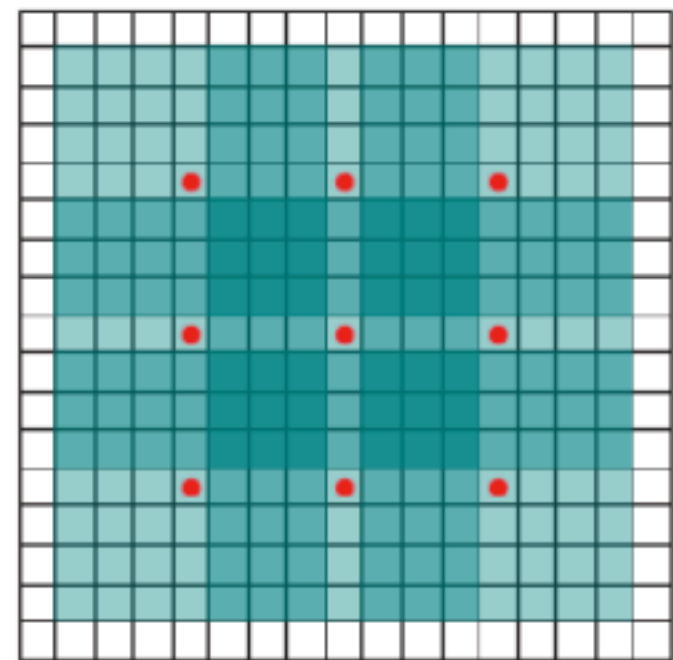# Dilated Convlutions
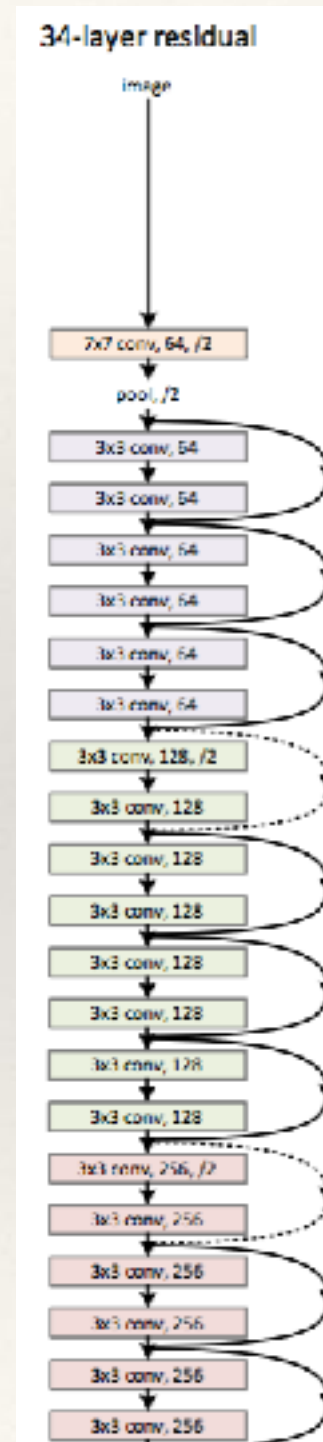

(a)   (b)   (c)
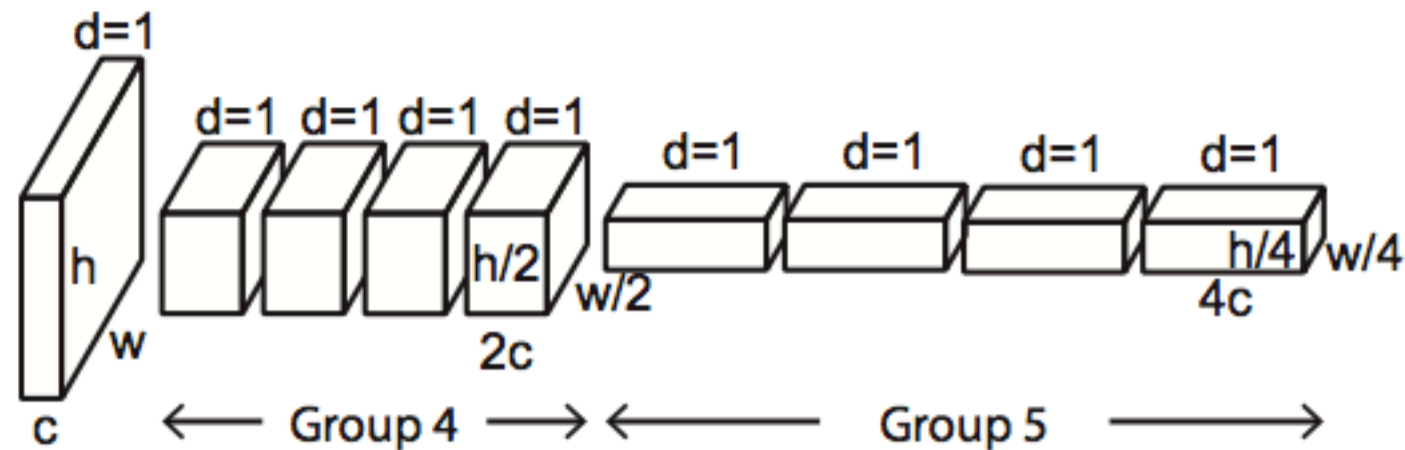
Dilated Residual Networks

Dilated Residual Networks

(a) ResNet
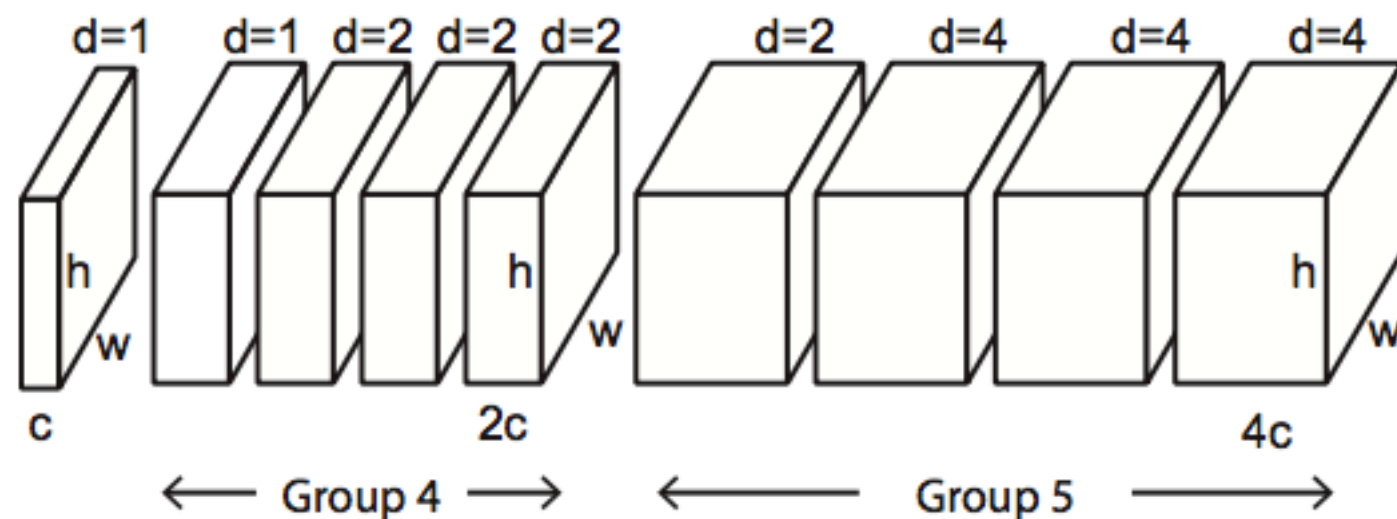
(b) DRN

Classification and Localization

(a) Classification output

(b) Localization output
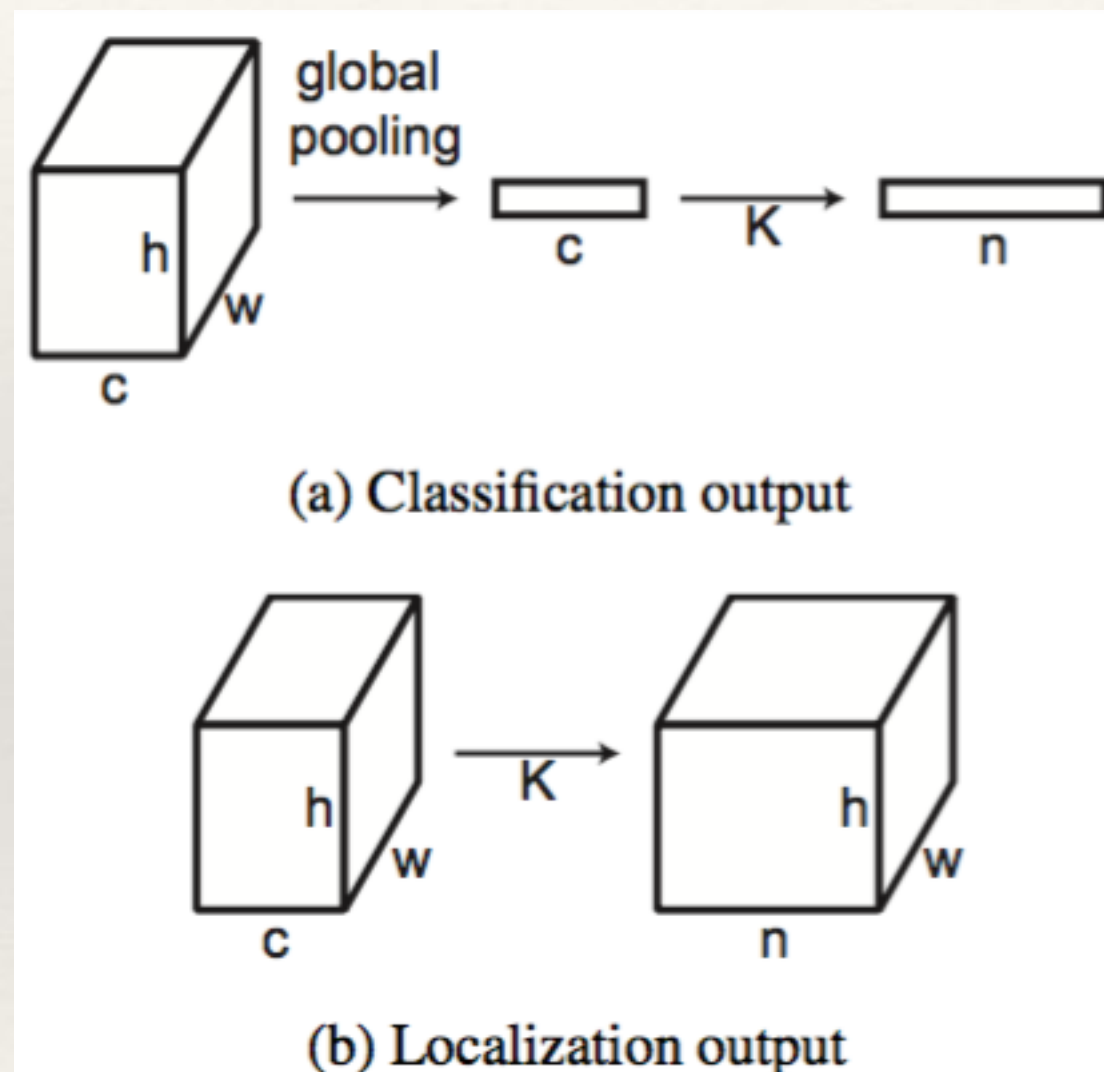
DRNs是为了图像分类而设计的网络，同时能够输出高分辨率的激活maps。

Degridding

(a) Input   (b) ResNet-18   (c) DRN-A-18   (d) DRN-B-26   (e) DRN-C-26
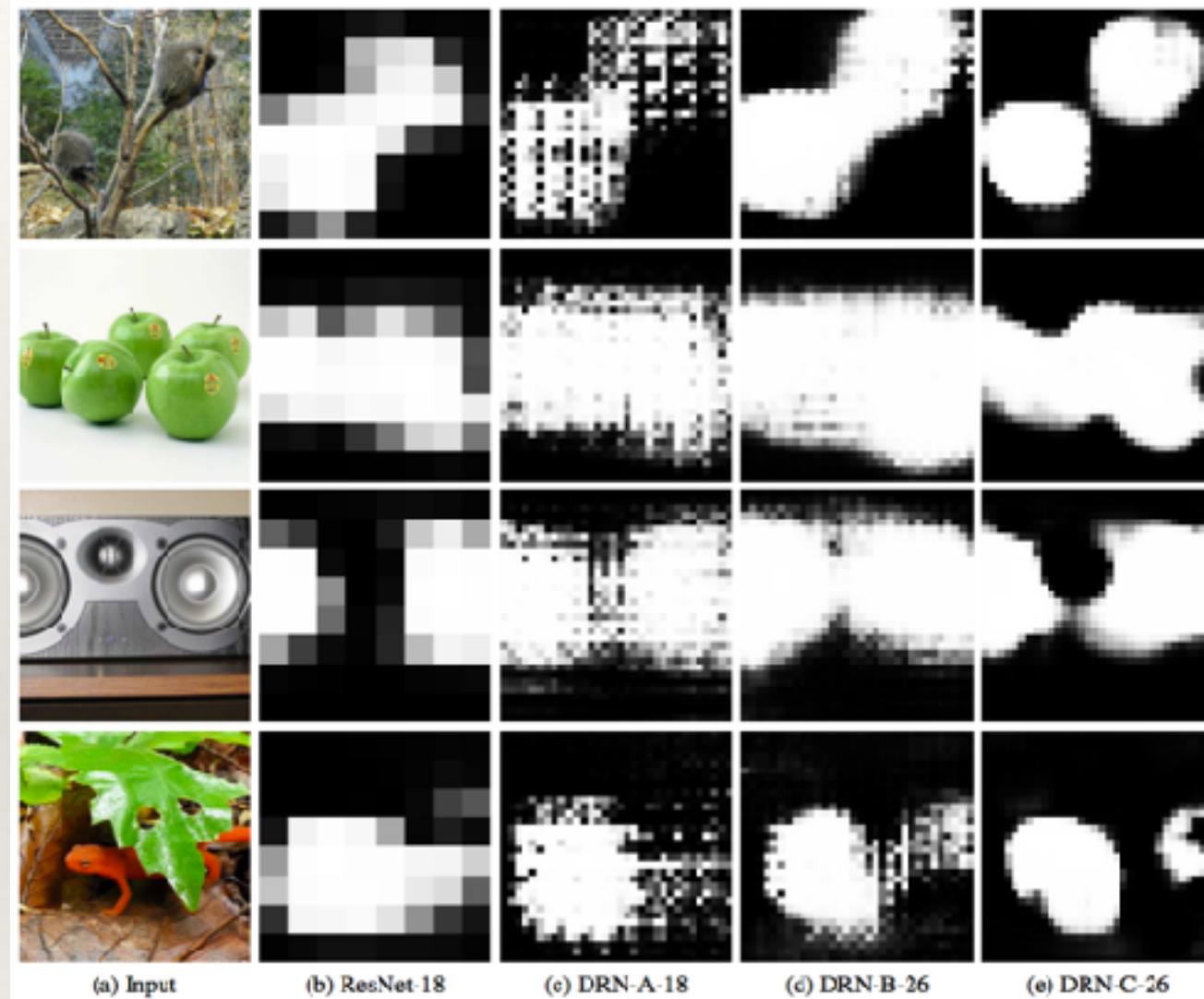
最终输出maps 会产生很差的网格状态（gridding artifacts），
通过removing max pooling 和 adding layers解决。

Degridding

通过removing max pooling 和 add layers等操作改善结果

Experiment Results

Model	1 crop		10 crops		P
	top-1	top-5	top-1	top-5	
ResNet-18	30.43	10.76	28.22	9.42	11.7M
DRN-A-18	28.00	9.50	25.75	8.25	11.7M
DRN-B-26	25.19	7.91	23.33	6.69	21.1M
DRN-C-26	24.86	7.55	22.93	6.39	21.1M
ResNet-34	27.73	8.74	24.76	7.35	21.8M
DRN-A-34	24.81	7.54	22.64	6.34	21.8M
DRN-C-42	22.94	6.57	21.20	5.60	31.2M
ResNet-50	24.01	7.02	22.24	6.08	25.6M
DRN-A-50	22.94	6.57	21.34	5.74	25.6M
ResNet-101	22.44	6.21	21.08	5.35	44.5M

Table 1: Image classification accuracy (error rates) on the ImageNet 2012 validation set. Lower is better. P is the number of parameters in each model.

Experiment Results

Model	top-1	top-5
ResNet-18	61.5	59.3
DRN-A-18	54.6	48.2
DRN-B-26	53.8	49.3
DRN-C-26	52.3	47.7
ResNet-34	58.7	56.4
DRN-A-34	55.5	50.7
DRN-C-42	50.7	46.8
ResNet-50	55.7	52.8
DRN-A-50	54.0	48.4
ResNet-101	54.6	51.9

Thank you