MULTI-SCALE CONTEXT AGGREGATION BY DILATED CONVOLUTIONS

develop a new convolutional network module that is specifically designed for dense prediction.

the model use dilated convolutions to systematically aggregate multi-scale contextual information without losing resolution.

the author develop a new convolutional network architecture that systematically use dilated convolutions for multi-scale context aggregation.

dilated convolution's dilation factor exponentially increasing,以2的倍数增加

the module takes C feature maps as input and produces C feature maps as output.

in basic form of the context module, each layer has C channels, and has same size with input.7层卷积使用了3*3 dilated convolution. each of these convolutions is followed by a pointwise truncation max(,0). A final layer performs 1×1×C convolutions and produces the ouptut of the module.

Layer	1	2	3	4	5	6	7	8
Convolution	3×3	3×3	3×3	3×3	3×3	3×3	3×3	1×1
Dilation	1	1	2	4	8	16	1	1
Truncation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Receptive field	3×3	5×5	9×9	17×17	33×33	65×65	67×67	67×67
Output channels								
Basic	C	C	C	C	C	C	C	C
Large	$2C$	$2C$	$4C$	$8C$	$16C$	$32C$	$32C$	C

ıble 1: Context network architecture. The network processes C feature maps by aggregating ıntextual information at progressively increasing scales without losing resolution.

因为输入大小64*64,所以第七层就没有在扩增卷积了。

训练失败，标准的初始化不支持训练这个module.
初始化方法：

$$k^b(\mathbf{t}, a) = 1_{[\mathbf{t}=0]} 1_{[a=b]}$$

a是 input feature map的index, b是output map 的 index.

希望通过权重初始化，能够使得前后两层的feature map一样：
$F2 = F1 * W$
tensorflow 有实现， identity_initializer