IE4497 RA6

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Question 1: For a convolutional layer, the input volume is 64x64x8, and the layer has 14 3x3 filters with stride 1, pad 0, what is the output volume size? What is the number of parameters in this layer?

Answer:

For the output volume size:

Input volume: 64x64x8
And 14 3x3 filters with stride 1, pad 0
Output volume size: (64+2*0-3)/1+1 = 62 spatially, so **62x62x14 (ans)**

For the number of parameters,

For each filter, we have: 3*3*8 + 1 = 73 parameters
Therefore, 14 filters have: 73*14 = **1022 parameters (ans)**

Question 2: For a convolutional layer, the input volume is 64x64x8 and the layer has 7 5x5 filters with stride 1, pad 2, what is the output volume size? What is the number of parameters in this layer?

Answer:

For the output volume size:

Input volume: 64x64x8
And 7 5x5 filters with stride 1, pad 2
Output volume size: (64+2*2-5)/1+1 = 64 spatially, so **64x64x7 (ans)**

For the number of parameters,

For each filter, we have: 5*5*8 + 1 = 201 parameters
Therefore, 7 filters have: 201*7 = **1407 parameters (ans)**

Question 3: For a pooling layer, the input volume is 64x64x8, the layer's spatial extent is 2 and its stride is 2, what is the output volume size? What is the number of parameters in this layer?

Answer:

For the output volume size:

Input volume: 64x64x8;
Spatial extent: F = 2;
Stride: S = 2
Output volume size: (64-2)/2 + 1 = 32 spatially, so **32x32x8 (ans)**

Number of parameters is **0** as pooling layers do not have learnable parameters (ans)