

Parameter Calculation

$$((m*n*d)+1)*k$$

↑
bias

m = shape of width of the filter

n = shape of height of the filter

d = # of filters in the previous layer.

k = Number of filters.

$$\text{Floor} \left\lfloor \frac{W-F+2P}{S} \right\rfloor + 1$$

quiz-3 set F

Layer	output shape	Parameter
input	442, 442	0
Cnn-1	$\left\lfloor \frac{442-5+2*2}{1} \right\rfloor + 1 = 442$ (4, 442, 442)	$((5*5*1)+1)*4 = 104$
Dropout	(4, 442, 442)	0
Relu	(4, 442, 442)	0
maxpool	$\left\lfloor \frac{442-2+0}{2} \right\rfloor + 1 = 221$ (4, 221, 221)	0
Cnn-2	$\left\lfloor \frac{221-5+4}{1} \right\rfloor + 1 = 221$ (8, 221, 221)	$((5*5*4)+1)*8 = 808$
Relu	(8, 221, 221)	
maxpool	$\left\lfloor \frac{221-2+0}{2} \right\rfloor + 1 = 110$ (8, 110, 110)	
Flatten	$8 \times 110 \times 110 = 96800$	0
Linear-1	512	$(96800 \times 512) + 512 = 49562112$
Relu	512	0
Linear-2	128	$(512 \times 128) + 128 = 65664$
Relu	128	0
Linear-3	10	$(128 \times 10) + 10 = 1290$
output	10	
Total = (49629378)		

set B

Input (438, 438)

Input \rightarrow Conv (3, 2, 16) \rightarrow maxpool(4) \rightarrow ReLU \rightarrow maxpool(3) \rightarrow

FCw (256) \rightarrow FC(5) \rightarrow output

Conv(x, y, z) \rightarrow x \rightarrow kernel size; y = stride; z = output channel

min/maxpool(x) \rightarrow both window size & stride = x.

FCw \rightarrow with bias FC \rightarrow without bias.

<u>input layer</u>	<u>output shape</u>	<u>parameter</u>
Input	(438, 438)	0
Conv	$\left\lfloor \frac{438 - 3 + 0 \times 2}{2} \right\rfloor + 1 = 218$ (16, 218, 218)	$((3 \times 3 \times 1) + 1) \times 16 = 160$
maxpool	$\left\lfloor \frac{218 - 4 + 2 \times 0}{4} \right\rfloor + 1 = 54$ (16, 54, 54)	0
Relu	16, 54, 54	0
maxpool	$\left\lfloor \frac{54 - 3 + 2 \times 0}{3} \right\rfloor + 1 = 18$ (16, 18, 18)	0
FCw	256	$(16 \times 18 \times 18) \times 256 + 256 = 1327360$
FC	5	$256 \times 5 = 1280$
Output	5	0