The Problem with Convolution

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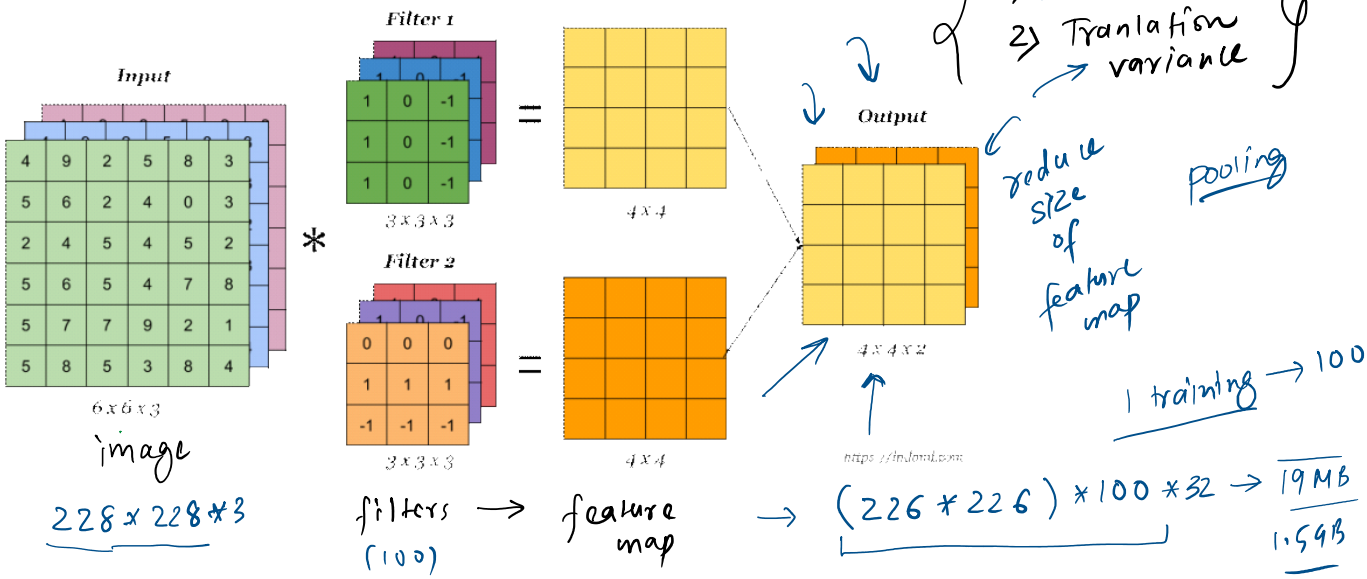

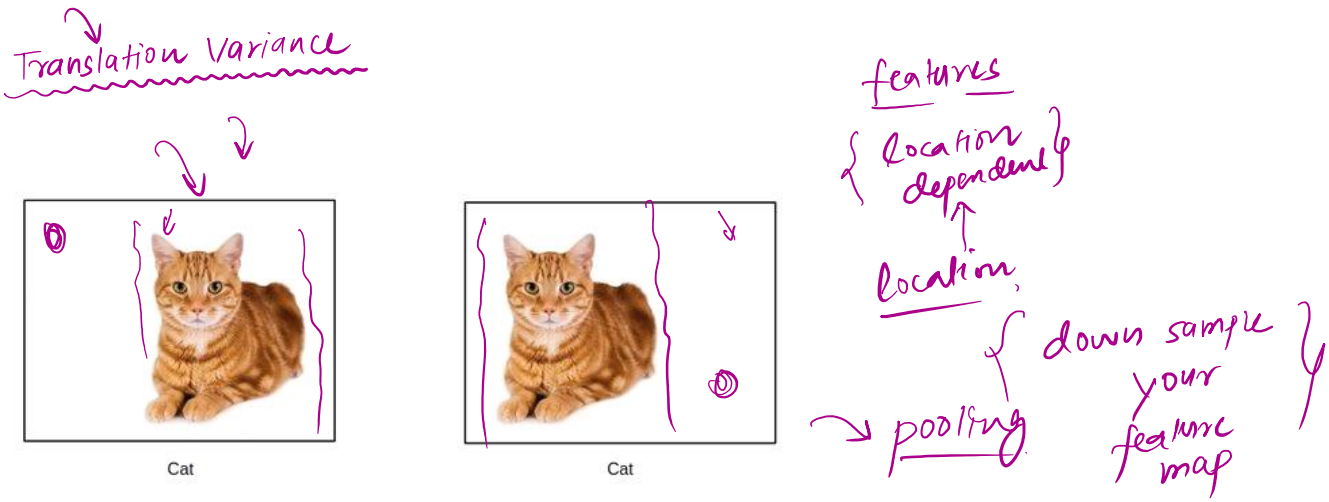

Pooling

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0	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0
255	255	255	255	255	255
255	255	255	255	255	255
255	255	255	255	255	255

*

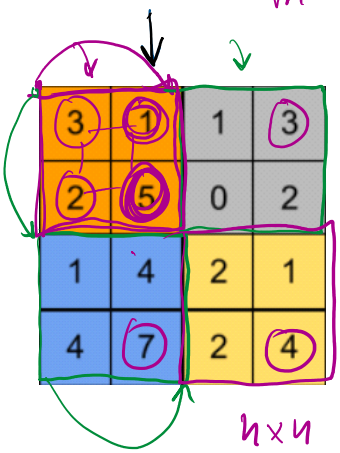
-1	-1	-1
0	0	0
1	1	1

= relu (4 x 4)

Maxpooling
Minpooling
Avg pooling
L2 pooling
Global pooling

feature map (non-linear)

max pooling



4 x 4

(size) → (2,2)
stride → (2)
type → Max

receptive field

5	3
7	4

feature map

2 x 2

low level details eliminat

Demo

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Pooling on Volumes

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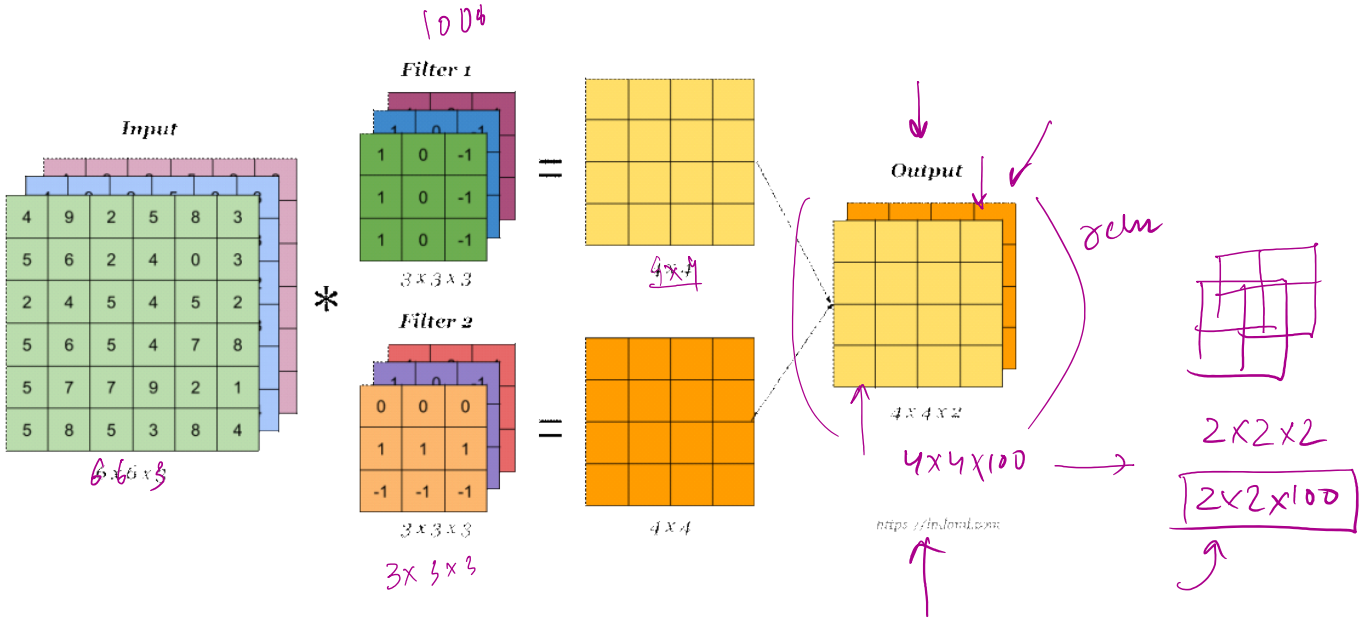

Advantages of Pooling

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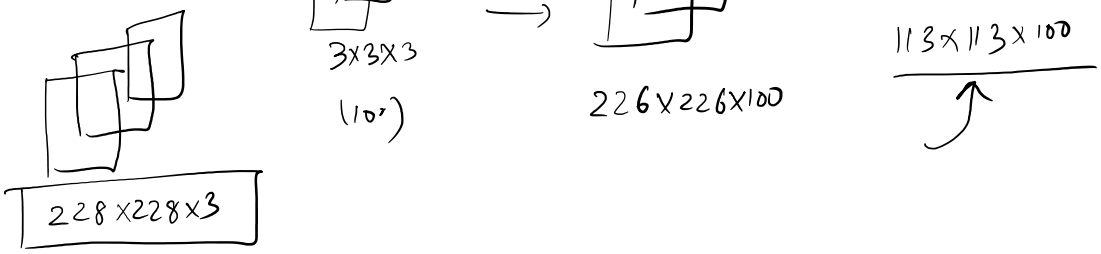
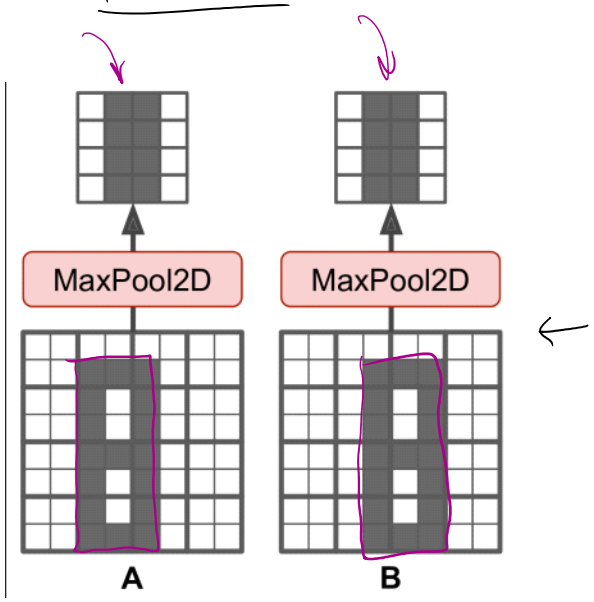
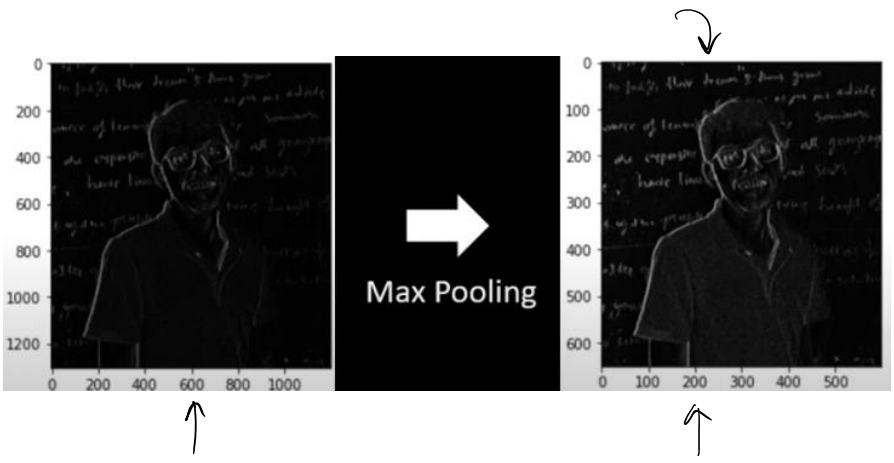
1) reduced size



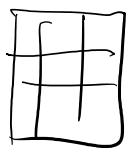
2) Translation invariance



3) Enhanced features (only in case of Max pooling)



4) No need of training

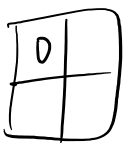


min

max pooling → aggregate

faster

avg pooling



→ (2x2)

→ 2

→ type

Keras Code

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Types of Pooling

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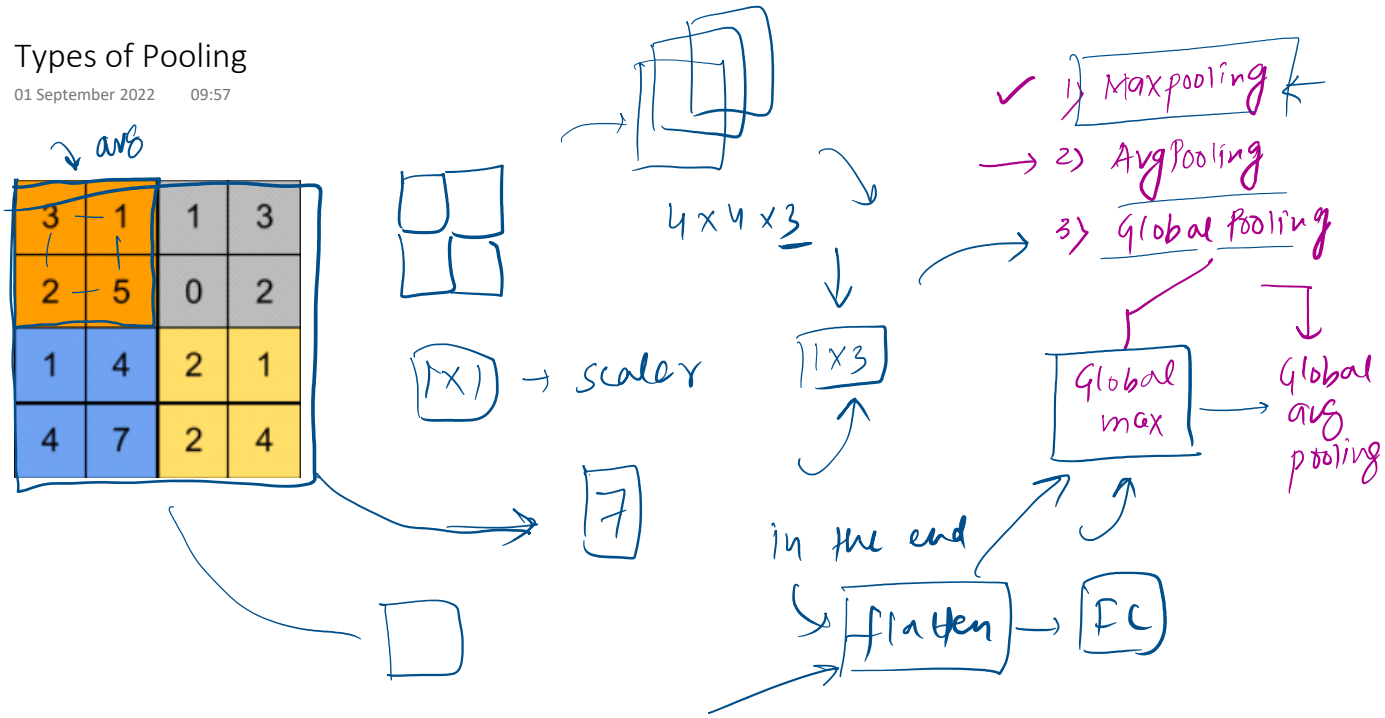

Disadvantages of Pooling

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lose a lot of info

4x4 → 16

2x2 → 4