

Convolutional Neural Networks

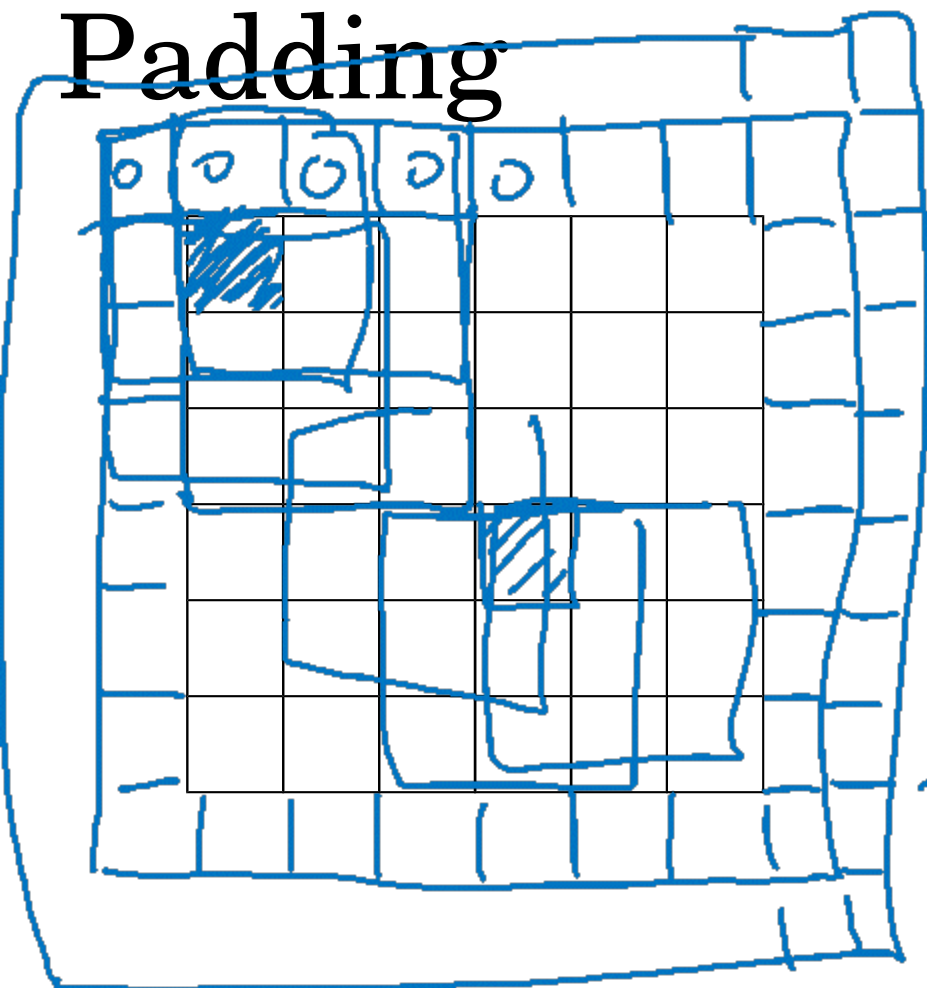


deeplearning.ai

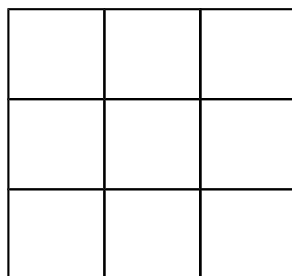
Padding

Padding

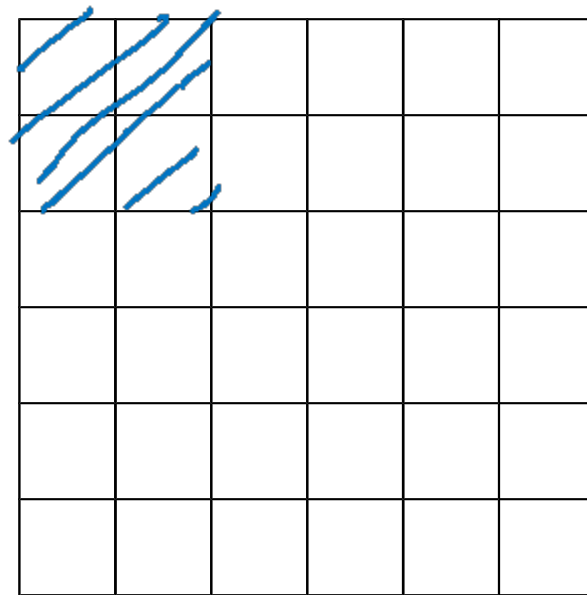
- Shrinky output
- throw away info from edge



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6x6

~~4x4~~

6x6 → 8x8
n x n

$$n - f + 1 \times n - f + 1$$

$$6 - 3 + 1 = 4$$

p = padding = 1

$$n + 2p - f + 1 \times n + 2p - f + 1$$

$$6 + 2 - 3 + 1 \times \text{---} = 6 \times 6$$

Valid and Same convolutions

→ no padding

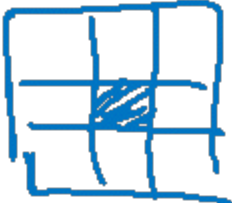
“Valid”: $n \times n$ \times $f \times f$ $\rightarrow \frac{n-f+1}{1} \times n-f+1$
 6×6 \times 3×3 $\rightarrow 4 \times 4$

“Same”: Pad so that output size is the same as the input size.

$$\begin{aligned} & n+2p-f+1 \times n+2p-f+1 \\ & \cancel{n+2p-f+1} = \cancel{n} \Rightarrow \boxed{p = \frac{f-1}{2}} \\ & 3 \times 3 \quad p = \frac{3-1}{2} = 1 \quad \left| \begin{array}{c} 5 \times 5 \\ f=5 \end{array} \right. \end{aligned}$$

f is usually odd

1x1
3x3
5x5
7x7



$p=2$