Convolutional Neural Networks

Padding

deeplearning.ai

Padding

- Shrinks output
- throw away info from edge

$\leftarrow$ Padding prevents:

$*$

3×3

$f \times f$

$p=2$

$=$

6×6

4×4
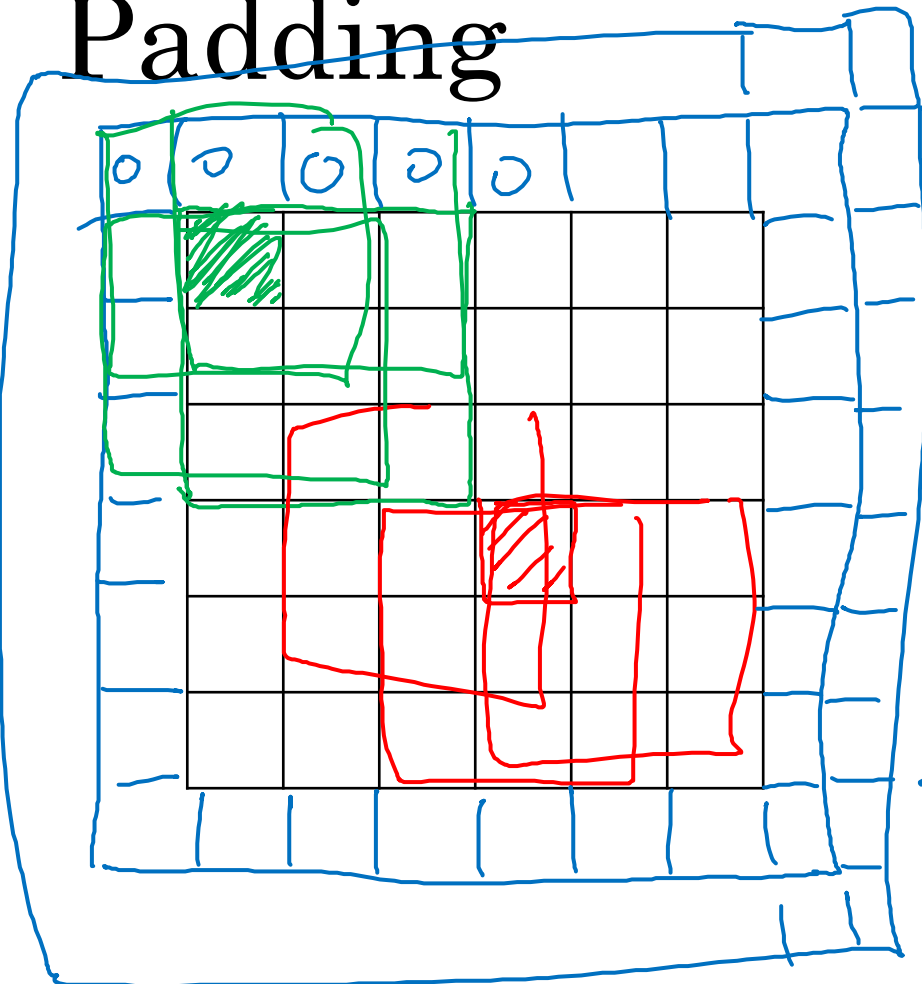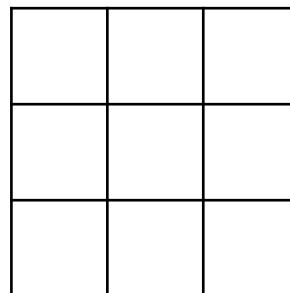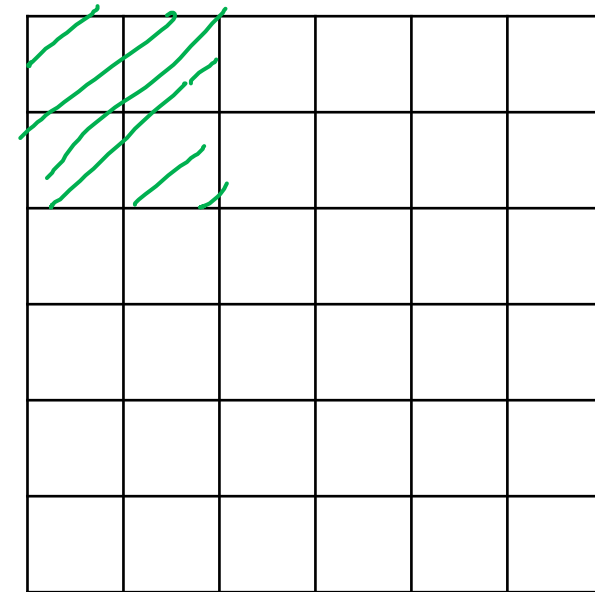
$\dfrac{6 \times 6 \rightarrow 8 \times 8}{n \times n}$

$P = \text{padding} = 1$

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

$6 - 3 + 1 = 4$

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

$6 + 2 - 3 + 1 \times \_\_ = 6 \times 6$
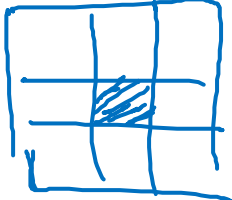
Valid and Same convolutions

no padding

"Valid": $n \times n$ $*$ $f \times f$ $\rightarrow$ $n-f+1 \times n-f+1$

6×6 $*$ 3×3 $\rightarrow$ 4×4

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

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

$n+2p-f+1 = n$ $\Rightarrow$ $p = \dfrac{f-1}{2}$

f is usually odd

3×3 $p = \dfrac{3-1}{2} = 1$ | 5×5 $p=2$

$f=5$

1×1
3×3
5×5
7×7

Andrew Ng