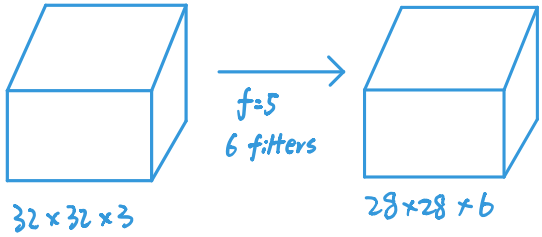
deeplearning.ai

Convolutional Neural Networks

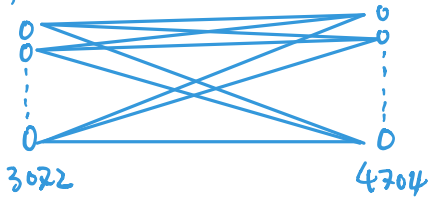
Why convolutions?

Why convolutions



filter size: 5×5 — 25
+1
26
6×26 = 156 parameters.

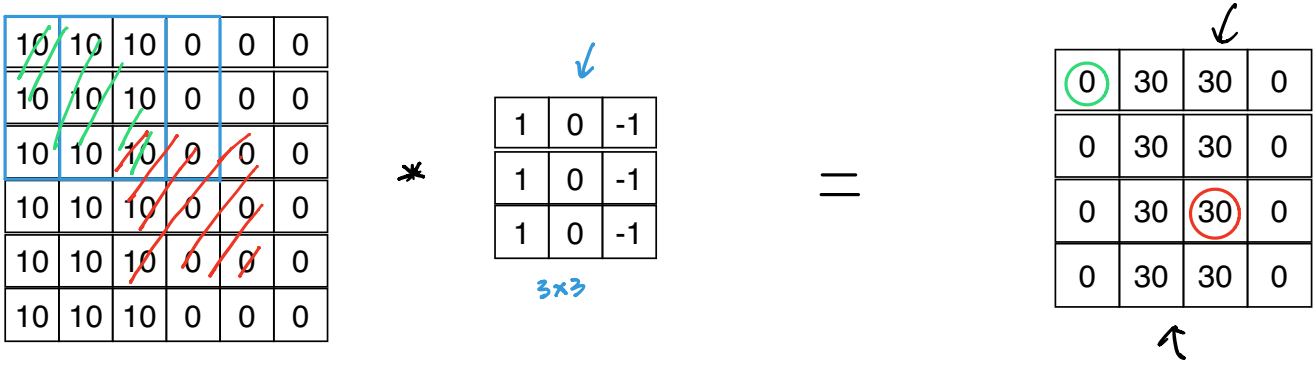
3,072
4,704



3072 × 4704 ≈ 14 million

Why convolutions

translation invariance.



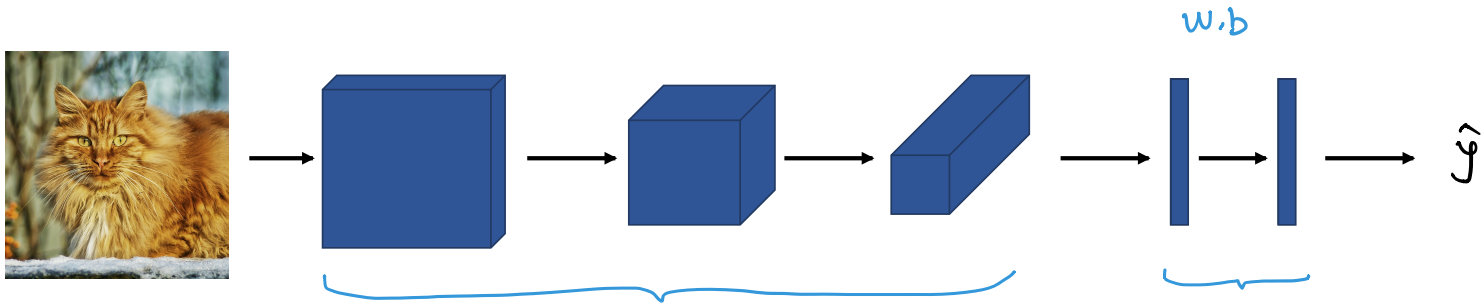
Parameter sharing: A feature detector (such as a vertical edge detector) that's useful in one part of the image is probably useful in another part of the image.

Sparsity of connections: In each layer, each output value depends only on a small number of inputs.

Andrew Ng

Putting it together

Training set $(x^{(1)}, y^{(1)}) \dots (x^{(m)}, y^{(m)})$



Cost $J = \frac{1}{m} \sum_{i=1}^{m} \mathcal{L}(\hat{y}^{(i)}, y^{(i)})$

Use gradient descent to optimize parameters to optimize J