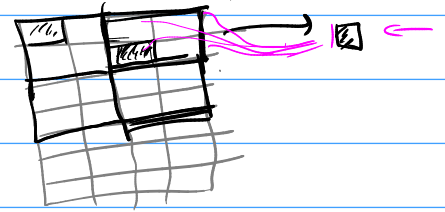


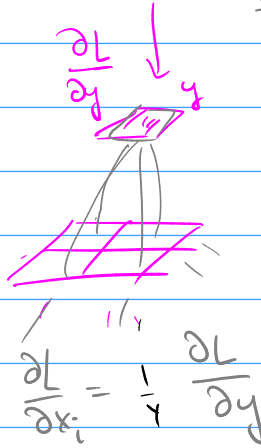
$$m \times n \times d \times d'$$

$$m \times n \times l \times 1$$

max-pooling
avg-pooling



$$w \times h$$



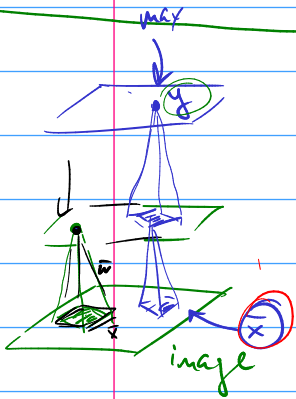
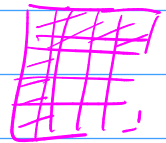
$$y = \frac{1}{4} \sum x_i$$

$$\frac{\partial L}{\partial x_i} = 0 \quad \frac{\partial L}{\partial x} = \frac{\partial L}{\partial y}$$

$$w \times h \times d \quad w \times h \times d'$$

$$w^2 \times h^2 \times d \times d'$$

$$28 \times 28 \times 6 \times 14 \times 14 \times 6$$



$$y = f(\underline{\bar{x}}, \underline{\bar{w}}^{(1)}, \underline{\bar{w}}^{(2)}) \rightarrow \max_{\bar{w}^{(1)}, \bar{w}^{(2)}}$$

$$y = f(\bar{x}, \underline{\bar{w}}^{(1)}, \underline{\bar{w}}^{(2)}) \rightarrow \max_{\bar{x}}$$

fixed

$$m \times n \times d \times d'$$

$$5 \times 5 \times 3 \times 6$$

150 weights

$$5 \times 5 \times 6 \times 16$$

2400 weights

augmentations

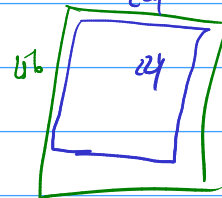
$$\frac{2048}{224}$$

$$6 \times 5 \times 5 = 150$$

$$400 \times 120 = 48000$$

$$120 \times 84 = 9000$$

$$84 \times 10 = 840$$



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ILSVRC

Augmentations)

Dan Ciresan

J. Schmidhuber

