

# Deep learning for big visual data

Hw 2

NM6111035

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$$\frac{\partial E}{\partial w_2} = \frac{\partial E}{\partial y_1} \times \frac{\partial y_1}{\partial o_1} \times \frac{\partial o_1}{\partial a_1} \times \frac{\partial a_1}{\partial h_1} \times \frac{\partial h_1}{\partial w_2}$$

$$\frac{\partial E}{\partial y_1} = y_1 - t_1$$

$$\frac{\partial y_1}{\partial o_1} = y_1 (1-y_1)$$

$$\frac{\partial o_1}{\partial a_1} = w_5$$

$$\frac{\partial a_1}{\partial h_1} = a_1 (1-a_1)$$

$$\frac{\partial h_1}{\partial w_2} = \lambda^2$$

$$\begin{aligned} \frac{\partial E}{\partial w_2} &= (y_1 - t_1) \times y_1 (1-y_1) \times w_5 \times a_1 (1-a_1) \times \lambda^2 \\ &= 0.001337 \end{aligned}$$

$$\frac{\partial E}{\partial w_1} = \frac{\partial E}{\partial y_2} \times \frac{\partial y_2}{\partial o_2} \times \frac{\partial o_2}{\partial a_1} \times \frac{\partial a_1}{\partial h_1} \times \frac{\partial h_1}{\partial w_2}$$

$$\frac{\partial E}{\partial y_2} = y_2 - t_2$$

$$\frac{\partial y_2}{\partial o_2} = y_2(1-y_2)$$

$$\frac{\partial o_2}{\partial a_1} = w_1$$

$$\frac{\partial a_1}{\partial h_1} = a_1(1-a_1)$$

$$\frac{\partial h_1}{\partial w_2} = i_2$$

$$\begin{aligned} \frac{\partial E}{\partial w_2} &= (y_2 - t_2)(y_2(1-y_2))(w_1)(a_1(1-a_1)) \times i_2 \\ &= -0.0005 \end{aligned}$$

$$\text{new } w_2 = 2 - 1_r(-0.0005 + 0.001337)$$

$$= \underline{0.1996} \#$$

$$(1 \times 1 \times 192 + 1) \times 64$$

+

$$(1 \times 1 \times 192 + 1) \times 128$$

+

$$(3 \times 3 \times 128 + 1) \times 128$$

+

$$(1 \times 1 \times 192 + 1) \times 32$$

+

$$(5 \times 5 \times 32 + 1) \times 3^2$$

$$(1 \times 1 \times 192 + 1) \times 3^2$$

11

$$\begin{array}{r} 1235^2 \\ + \\ \hline \end{array}$$

$$24704$$

+

$$147584$$

+

6176

+

25632

+

6176

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222624

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