

Deep learning for big visual data

Hw 2

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

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

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

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

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

$$\frac{\partial h_1}{\partial w_2} = \lambda_2$$

$$\begin{aligned} \frac{\partial E}{\partial w_2} &= (y_1 - t_1) \times y_1 (1 - y_1) \times w_5 \times a_1 (1 - a_1) \times \lambda_2 \\ &= 0.001337 \end{aligned}$$

$$\frac{\partial E}{\partial w_1} = \frac{\partial E}{\partial y_1} \times \frac{\partial y_1}{\partial o_1} \times \frac{\partial o_1}{\partial a_1} \times \frac{\partial a_1}{\partial h_1} \times \frac{\partial h_1}{\partial w_1}$$

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

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

$$\frac{\partial o_1}{\partial a_1} = w_1$$

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

$$\frac{\partial h_1}{\partial w_1} = x_1$$

$$\frac{\partial E}{\partial w_1} = (y_1 - t_1)(y_1(1-y_1))(w_1)(a_1(1-a_1)) \times x_1$$

$$= -0.0005$$

$$new\ w_1 = 2 - 1 \times (-0.0005 + 0.001337)$$

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

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

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

$$(3 \times 3 \times 128 + 17 \times 128)$$

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

$$(5 \times 5 \times 32 + 11 \times 32)$$

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

11

$$1235^2$$

$$24704$$

+

$$147584$$

+

6176

+

25632

+

6176

'1

222624 #