

Assignment 2
Computer Vision and Deep Learning

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1 Task 1a: Backpropagation

we have that

$$w_{kj} := w_{kj} - \alpha \frac{\partial C}{\partial w_{kj}} = w_{kj} - \alpha \delta_k a_j \quad (1)$$

and

$$w_{ji} := w_{ji} - \alpha \frac{\partial C}{\partial w_{ji}} \quad (2)$$

and so we have that

$$\delta_j = \frac{\partial C}{\partial z_j}. \quad (3)$$

so we have that

$$w_{ji} := w_{ji} - \alpha \frac{\partial C}{\partial z_j} \frac{\partial z_j}{\partial w_{ji}} \quad (4)$$

and we know that

$$z_j = \sum_{i=0}^n w_{ji} x_i \quad (5)$$

so we have that

$$w_{ji} := w_{ji} - \alpha \frac{\partial C}{\partial z_j} \frac{\sum_{i=0}^n w_{ji} x_i}{\partial w_{ji}} \quad (6)$$

$$w_{ji} := w_{ji} - \alpha \delta_j x_i \quad (7)$$

and we would show that $\delta_j = f'(z_j) \sum_k w_{ji} \delta_k$.