Ans to the Q/A no. 4

Given,

Local induced gradient, δm

output neuron = ∂f

f layer, $y_f = \varphi'(v_f)$

h layer, $y_n = \varphi''(v_n)$

p layer, $y_p = \varphi'''(v_p)$

m layer, $y_m = \varphi'(v_m)$

$$v_j = \sum_j^i w_j y_i$$

$$e_j = d_j - y_j$$

$$E = 1/2 \sum_j e_j^2$$

$$\partial m = \frac{-\partial E}{\partial v_m}$$

$$= \frac{\delta E}{\delta \cancel{e}m} \cdot \frac{\delta \cancel{e}m}{\partial y_m} \cdot \frac{\partial y_m}{\partial v_m}$$

$$= - \frac{\partial E}{\delta y_m} \cdot \frac{\delta y_m}{\partial v_m}$$

$$= \frac{-\delta E}{\delta y_m} \cdot \cancel{\varnothing} \cdot (v_m)$$

$$\frac{\delta E}{\partial y_m} = \frac{-\partial E}{\delta e_F} \cdot \frac{\partial e_F}{\partial y_F} \cdot \frac{\partial y_F}{\partial v_f} \cdot \frac{\partial v_f}{\partial y_n} \cdot$$

$$\frac{\partial y_h}{\partial v_n} \cdot \frac{\delta v_n}{\partial y_p} \cdot \frac{\delta y_p}{\delta v_p} \cdot \frac{\delta v_e}{\partial y_m}$$

Now,

$$F = \frac{1}{2} \sum_{F \in C} F^2$$

So,

$$\text{Computation} = -\sum_{F \in L} e_f \cdot -1 \cdot \varphi \cdot W_{Fn} \cdot \varphi''(v_n) \cdot W_{np}$$

$$\varphi'''(v_p) \cdot W_{pm}$$

$$= \sum_{j \in C} e_j \cdot \varphi'(v_j) \cdot W_{jn} \cdot \varphi''(v_n) \cdot W_{np}$$

$$\cdot \varphi'''(v_p) \cdot W_{pp}$$

$$= \sum_{j \in C} \delta_f \cdot w_{fh} \cdot \varphi''(v_n) \cdot W_{hp} \varphi''$$

$$(v_o) \cdot W_{pm}$$