8° Para W

$$l(w,a) = \ln \underbrace{\sum_{i=1}^{K} g_i e^{(-1/2 \|e_i\|^2)}}_{\mu}$$

$$\frac{\partial l(w,a)}{\partial w} = \ln \mu = \frac{1}{\mu} = \frac{1}{\sum_{i=1}^{K} g_i e^{(-1/2 \|e_i\|^2)}}$$

$$g_i e^{(-1/2 \|e_i\|^2)} \cdot (-e_i) \cdot (-x)$$

$$\frac{\partial l(w,a)}{\partial w} = \frac{g_i e^{(-1/2 \|e_i\|^2)}}{\sum_{i=1}^{K} g_i e^{(-1/2 \|e_i\|^2)}} \cdot e_i x$$

$$\frac{\partial l(w,a)}{\partial w} = \nabla l(w,a)$$

$$W_i(m+1) = W_{i(m)} + \eta \nabla l(w,a)$$

$$W_i(m+1) = W_i(m) + \eta \cdot \underbrace{\frac{g_i e^{(-1/2 \|e_i\|^2)}}{\sum_{i=1}^{K} g_i e^{(-1/2 \|e_i\|^2)}}}_{h_i(m)} \cdot e_i x$$

$$W_i(m+1) = W_i(m) + \eta\, h_i(m)\, e_i(m)\, X$$

Para a

$$\frac{\partial l(W,a)}{\partial a} = \ln \mu = \frac{1}{\mu} = \frac{1}{\sum_{i=1}^{K} g_i e^{(-1/2\,\|e_i\|^2)}}$$

$$g_i e^{(-1/2\,\|e_i\|^2)}$$

$$g_i [1 - g_i] . e^{(-1/2\,\|e_i\|^2)}$$

$$\frac{\partial l(W,a)}{\partial a} = \frac{g_i e^{(-1/2\,\|e_i\|^2)} \cdot [1 - g_i]}{\sum_{i=1}^{K} g_i e^{(-1/2\,\|e_i\|^2)}}$$

$$\frac{\partial l(W,a)}{\partial a} = \nabla l(W,a)$$

$$a_i(m+1) = a_i(m) + \mu \nabla l(W,a)$$

$$a_i(m+1) = a_i(m) + \mu . \underbrace{\frac{g_i e^{(-1/2\,\|e_i\|^2)}}{\sum_{i=1}^{K} g_i e^{(-1/2\,\|e_i\|^2)}}}_{h_i(m)} .[1-g_i]$$

$$a_i(m+1) = a_i(m) + \mu\, h_i(m) [1 - g_i]$$