

$$\begin{array}{l} l l = \\ l = \\ 2, \ldots, L - \\ l = \\ l \\ D_l D_l z_j a_j j = \\ 1, \ldots, D_l D_1, D_L \\ x = \\ (x_1, \ldots, x_{D_L})^T x_j l = \\ 1 j \end{array}$$

$$(1) \quad \begin{array}{l} a_j^{(1)} = x_j. \\ ll = \\ 2, \ldots, L j l - \\ 1 \end{array}$$

$$(2) \quad \begin{array}{l} z_j^{(l)} = b_j^{(l)} + \sum_{i=1}^{D_{l-1}} w_{ji}^{(l)} a_i^{(l-1)}. \\ l = \\ 2, \ldots, L - \\ 1 \\ a_j^{(l)} z_j^{(j)} f \end{array}$$

$$(3) \quad \begin{array}{l} a_j^{(l)} = f(z_j^{(l)}). \\ l = \\ L g \\ g R^{D_L} \rightarrow \\ R^{D_L} \end{array}$$

$$(4) \quad \begin{array}{l} a^{(L)} = g(z^{(L)}), \\ (L) = \\ (a)_1^{(L)} \end{array}$$

$$\begin{array}{l} a_{D_L}^{(L)}, z^{(L)} = \\ (z)_1^{(L)} \end{array}$$

$$\begin{array}{l} z_{D_L}^{(L)} \\ (L) \Big) = \\ \frac{1}{\sum_{j=1}^{D_L} \exp(z_j^{(L)})} \, (\exp) \, (z_1^{(L)}) \end{array}$$

$$\begin{array}{l} \exp(z_{D_L}^{(L)}) \\ g D_L R \rightarrow \\ R \\ (L) \Big) = \\ (\tanh) \, (z_1^{(L)}) \end{array}$$

$$\begin{array}{l} \tanh(z_{D_L}^{(L)}) \\ ?? \\ ?? \\ ?? \\ ?? a, z, b, w \\ (l) = \\ (z)_1^{(l)} \end{array}$$

$$\begin{array}{l} z_{D_l}^{(l)}, a^{(l)} = \\ (a)_1^{(l)} \end{array}$$

$$\begin{array}{l} a_{D_1}^{(L)}, b^{(l)} = \\ (b)_1^{(l)} \end{array}$$

$$\begin{array}{l} b_{D_l}^{(l)}, W^{(l)} = \\ (w)_{ji}^{(l)}, \\ f(\cdot) \\ (z)_{11} \ldots z_{1c} \end{array}$$