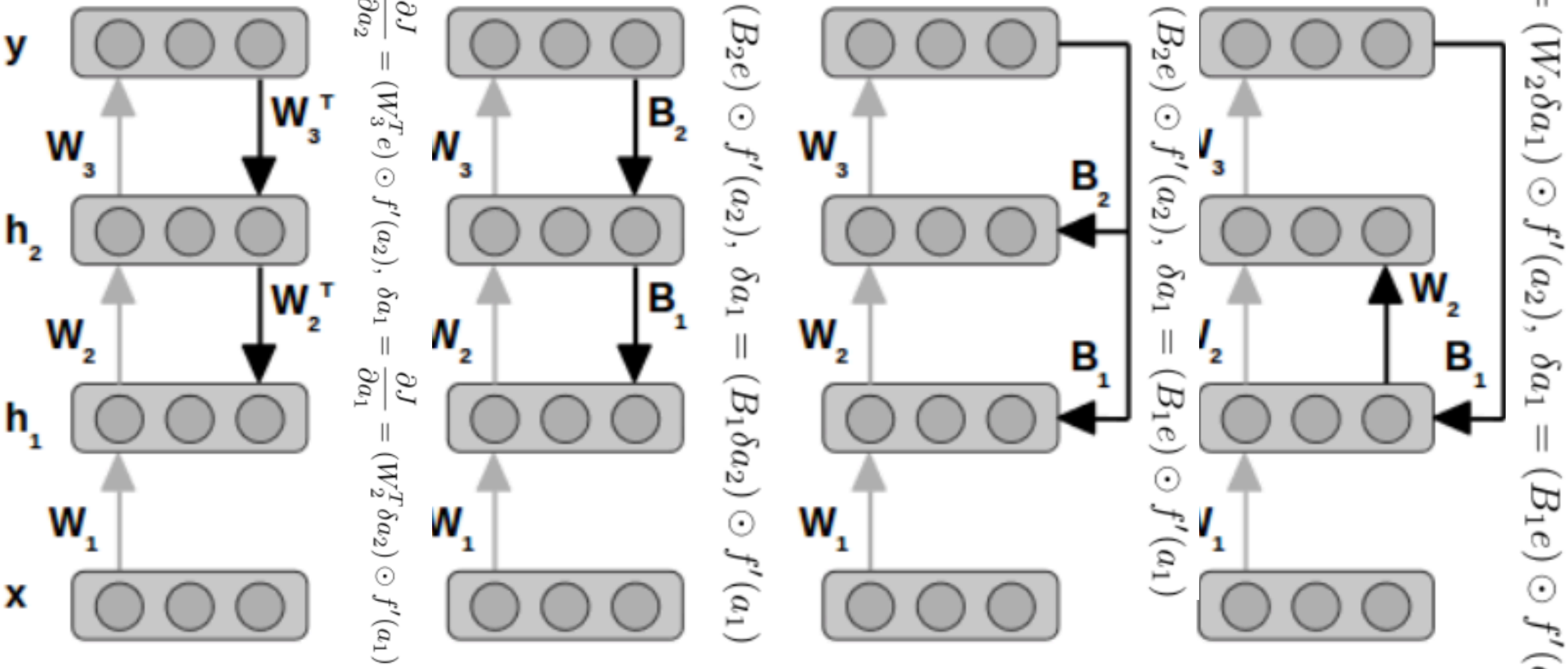

$$a_1 = W_1 x + b_1,\ h_1 = f(a_1)$$
$$a_2 = W_2 h_1 + b_2,\ h_2 = f(a_2)$$
$$a_y = W_3 h_2 + b_3,\ \hat{y} = f_y(a_y)$$

Eq 1–3. (Nøkland, 2016)

$$J = -\frac{1}{N}\sum_{m,n} y_{mn}\log\hat{y}_{mn} + (1 - y_{mn})\log(1 - \hat{y}_{mn})$$

$$e = \delta a_y = \frac{\partial J}{\partial a_y} = \hat{y} - y$$

$$\delta W_1 = -\delta a_1 x^T,\ \delta W_2 = -\delta a_2 h_1^T,\ \delta W_3 = -e h_2^T$$

BP

$$\delta a_2 = \frac{\partial J}{\partial a_2} = (W_3^T e) \odot f'(a_2),\ \delta a_1 = \frac{\partial J}{\partial a_1} = (W_2^T \delta a_2) \odot f'(a_1)$$

FA

$$\delta a_2 = (B_2 e) \odot f'(a_2),\ \delta a_1 = (B_1 \delta a_2) \odot f'(a_1)$$

DFA

$$\delta a_2 = (B_2 e) \odot f'(a_2),\ \delta a_1 = (B_1 e) \odot f'(a_1)$$

IFA

$$\delta a_2 = (W_2 \delta a_1) \odot f'(a_2),\ \delta a_1 = (B_1 e) \odot f'(a_1)$$