

$$\frac{dC[t]}{d\theta_i} = S_i \left(\frac{\partial f_i}{\partial \theta_i} \right) + \sum_{n=1}^N S_n \left(f'_n(\hat{y}_n[t]) \sum_{p=1}^P a_{ni}^{(p)} \frac{\partial}{\partial \theta_i} g_i(z_i[t-p], \theta_i) \right).$$