

$$\begin{bmatrix} \hat{\zeta}_1 \\ \hat{\lambda}_1 \\ \hat{\zeta}_2 \\ \hat{\lambda}_2 \\ \vdots \\ \hat{\zeta}_n \\ \hat{\lambda}_n \\ \hat{\theta}_1 \\ \hat{\theta}_2 \\ \vdots \\ \hat{\theta}_N \end{bmatrix}_{t+1} = \begin{bmatrix} \hat{\zeta}_1 \\ \hat{\lambda}_1 \\ \hat{\zeta}_2 \\ \hat{\lambda}_2 \\ \vdots \\ \hat{\zeta}_n \\ \hat{\lambda}_n \\ \hat{\theta}_1 \\ \hat{\theta}_2 \\ \vdots \\ \hat{\theta}_N \end{bmatrix}_t - \begin{bmatrix} \frac{\partial^2 L}{\partial \zeta_1^2} & \frac{\partial^2 L}{\partial \zeta_1 \partial \lambda_1} & & & & & & & & & \\ & \frac{\partial^2 L}{\partial \lambda_1 \partial \zeta_1} & & & & & & & & & \\ & & \frac{\partial^2 L}{\partial \zeta_2^2} & \frac{\partial^2 L}{\partial \zeta_2 \partial \lambda_2} & & & & & & & \\ & & \frac{\partial^2 L}{\partial \lambda_2 \partial \zeta_2} & \frac{\partial^2 L}{\partial \lambda_2^2} & & & & & & & \\ & & & & \ddots & & & & & & \\ & & & & & \frac{\partial^2 L}{\partial \zeta_n^2} & \frac{\partial^2 L}{\partial \zeta_n \partial \lambda_n} & & & & \\ & & & & & \frac{\partial^2 L}{\partial \lambda_n \partial \zeta_n} & \frac{\partial^2 L}{\partial \lambda_n^2} & & & & \\ & & & & & & & \frac{\partial^2 L}{\partial \theta_1^2} & & & \\ & & & & & & & \frac{\partial^2 L}{\partial \theta_2^2} & & & \\ & & & & & & & & \ddots & & \\ & & & & & & & & & \frac{\partial^2 L}{\partial \theta_N^2} & \end{bmatrix}^{-1} \times \begin{bmatrix} \frac{\partial L}{\partial \zeta_1} \\ \frac{\partial L}{\partial \lambda_1} \\ \frac{\partial L}{\partial \zeta_2} \\ \frac{\partial L}{\partial \lambda_2} \\ \vdots \\ \frac{\partial L}{\partial \zeta_n} \\ \frac{\partial L}{\partial \lambda_n} \\ \frac{\partial L}{\partial \theta_1} \\ \frac{\partial L}{\partial \theta_2} \\ \vdots \\ \frac{\partial L}{\partial \theta_N} \end{bmatrix}_t$$