$$\boldsymbol{\mu}^{(k+1)} \leftarrow \sum_{i=1}^{N} \hat{f}(\mathbf{z}_i) z_i \,,$$

$$\boldsymbol{s}^{(k+1)} \leftarrow \boldsymbol{s}^{(k)} + \frac{1}{2} \underbrace{\left(R^{(k)} + Q^{(k)} \overbrace{\frac{\partial^2 \mathcal{J}}{\partial \boldsymbol{\sigma} \partial \boldsymbol{\sigma}^T}}^{\to \mathcal{J}_\Sigma} Q^{(k)\top} \right)^{-1}}_{= \tilde{\mathcal{H}}_{\mathbf{s}}^{(k)^{-1}}} Q^{(k)} \cdot \operatorname{vec}\left(\Sigma^{(k)^{-1}} \left(\sum_{i=1}^{N} \hat{f}(\mathbf{z}_i) \left(z_i - \boldsymbol{\mu}^{(k)} \right) \left(z_i - \boldsymbol{\mu}^{(k)} \right)^\top - \Sigma^{(k)} \right) \Sigma^{(k)^{-1}} \right) D \,.$$