Data: $\boldsymbol{B}, \mathcal{H}(), \boldsymbol{H}, \boldsymbol{R}, o$, etc.

Input: x_j^g : guess

Input: $\hat{x}_0^s = x_j^g - x^b$: x-increment

Input: $\hat{y}_0^s = \boldsymbol{B}\hat{x}_0^s$: y-increment

1   $g_0^{\hat{y}} = 0.$

2   $d_0^{\hat{x}} = 0.$

3   $d_0^{\hat{y}} = 0.$

4   $\hat{x}_0 = 0.$

5   **do** $i = 1, \dots$

6      $\hat{g}_i^{\hat{x}} = \boldsymbol{H}^T \boldsymbol{R}^{-1}(\mathcal{H}(x_j^g + \hat{x}_{i-1}) - o)$

7      $\hat{g}_i^{\hat{y}} = \boldsymbol{B}\hat{g}_i^{\hat{x}}$

8      $g_i^{\hat{x}} = \hat{y}_{i-1}^s + \hat{g}_i^{\hat{x}}$

9      $g_i^{\hat{y}} = \hat{x}_{i-1}^s + \hat{g}_i^{\hat{y}}$

10     $\hat{f}_i = g_i^{\hat{y}} - g_{i-1}^{\hat{y}}$

11     $\beta_i = \hat{f}_i^T g_i^{\hat{y}} / \hat{f}_i^T d_{i-1}^{\hat{x}}$

12     $d_i^{\hat{x}} = -g_i^{\hat{y}} + \beta_i d_{i-1}^{\hat{x}}$

13     $d_i^{\hat{y}} = -g_i^{\hat{x}} + \beta_i d_{i-1}^{\hat{y}}$

14   minimize $J(\hat{x}_{i-1} + \alpha_i d_i^{\hat{x}})$ for α_i

15     $\hat{x}_i = \hat{x}_{i-1} + \alpha_i d_i^{\hat{x}}$

16     $\hat{x}_i^s = \hat{x}_{i-1}^s + \alpha_i d_i^{\hat{x}}$

17     $\hat{y}_i^s = \hat{y}_{i-1}^s + \alpha_i d_i^{\hat{y}}$

18   **enddo**

Result: $\hat{x}^s \longleftarrow \hat{x}_i^s$

Result: $\hat{y}^s \longleftarrow \hat{y}_i^s$

Result: $x_j^a \longleftarrow x_j^g + \hat{x}_i$