Initialization

$$\begin{aligned}
\mathbf{G} &= \mathbf{D}^\intercal\mathbf{D} && (1)\\
\mathbf{a}^{(0)} &= 0 && (2)\\
e^{(0)} &= x^{(0)} && (3)\\
w^{(0)} &= \|\mathbf{e}^{(0)}\|^2 && (4)\\
\mathbf{r}^{(0)} &= \mathbf{D}^\intercal\mathbf{e}^{(0)} && (5)\\
\mathbf{h}_k^{(0)} &= \|\mathbf{D}_k - \mathbf{e}^{(0)}\|^2 = g_{kk} - 2r_k + w^{(0)} && (6)\\
t &= 0 && (7)
\end{aligned}$$

Loop

$$\begin{aligned}
j^* &= \arg\min_j \left\{\|\mathbf{h}_j^{(t)}\|\right\} && (8)\\
w^{(t+1)} &= \mathbf{h}_{j^*}^{(t)} && (9)\\
\mathbf{r}^{(t+1)} &= \mathbf{r}^{(t)} - \mathbf{g}_{j^*} && (10)\\
h_k^{(t+1)} &= \|\mathbf{e}^{(t)} - \mathbf{d}_k - \mathbf{d}_{j^*}\| && (11)\\
&= \|(\mathbf{e}^{(t)} - \mathbf{d}_k) - \mathbf{d}_{j^*}\| && (12)\\
&= [(\mathbf{e}^{(t)} - \mathbf{d}_k) - \mathbf{d}_{j^*}]^\intercal[(\mathbf{e}^{(t)} - \mathbf{d}_k) - \mathbf{d}_{j^*}] && (13)\\
&= h_k^{(t)} - 2\mathbf{d}_{j^*}^\intercal(\mathbf{e}^{(t)} - \mathbf{d}_k) + \mathbf{d}_{j^*}^\intercal\mathbf{d}_{j^*} && (14)\\
&= h_k^{(t)} - 2r_{j^*}^{(t)} + 2g_{kj^*} + g_{j^*j^*} && (15)\\
& && (16)
\end{aligned}$$