$\mathbf{r}_0 = \mathbf{b} = \mathbf{A}\mathbf{x}_0$

$i = 0$

While $\|\mathbf{r}_i\| \leq TOL$

$i = 0$

$i = 0$

`true`

$\alpha_i = 0$

$\varnothing$

`false`

$\alpha_i = \frac{\mathbf{r}_i{}^T \mathbf{r}_i}{\mathbf{r}_{i-1}{}^T \mathbf{r}_{i-1}}$

$\mathbf{x}_{i+1} = \mathbf{x}_i + \alpha_i \mathbf{r}_i$

$\mathbf{b}_{i+1} = \mathbf{b} - \mathbf{A}\mathbf{x}_{i_1}$

For $j = 1, ..., i$

$\beta_i = \frac{[[x_{i+1}, \mathbf{p}_i]]}{\mathbf{p}_i{}^T \mathbf{a} \mathbf{p}_i}$

$\mathbf{p}_{i+1} = \mathbf{x}_{i+1} - \beta_i \mathbf{p_i}$

$\mathbf{P} = \mathbf{I} - \mathbf{AG}(\mathbf{G}^T \mathbf{AG})^{-1} \mathbf{G}^T$