

$$\mathbf{x}_0 = \Pi \mathbf{x}_{00} + \mathbf{U}(\mathbf{U}^T \mathbf{A} \mathbf{U})^+ \mathbf{U}^T \mathbf{b}$$

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

$$\mathbf{z}_0 = \mathbf{H} \mathbf{r}_0$$

$$\mathbf{p}_0 = \Pi \mathbf{z}_0$$

While not converged

$$\mathbf{q}_i = \mathbf{A} \mathbf{p}_i$$

$$\alpha_i = \frac{\langle \mathbf{r}_i \mathbf{z}_i \rangle}{\langle \mathbf{q}_i \mathbf{p}_i \rangle}$$

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

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

$$\mathbf{z}_{i+1} = \mathbf{H} \mathbf{r}_{i+1}$$

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For $j = 1, \dots, i$

$$\frac{\langle \mathbf{z}_{i+1}, \mathbf{A} \mathbf{p}_j \rangle}{\langle \mathbf{p}_j, \mathbf{A} \mathbf{p}_j \rangle}$$

$$\mathbf{p}_{i+1} = \Pi \mathbf{z}_{i+1} - \beta_i \mathbf{p}_i$$