Algorithm 1: Richardson's method

 $\begin{array}{l} x_0 \text{ given} \\ r_0 = b - A \, x_0 \\ k = 0 \\ \hline \mathbf{repeat} \\ \left| \begin{array}{l} p_k = r_k \\ \alpha_k = \tau \\ x_{k+1} = x_k + \alpha_k \, p_k \\ r_{k+1} = r_k - \alpha_k \, A \, p_k \end{array} \right| = b - A \, x_{k+1} \\ k = k + 1 \\ \hline \mathbf{until \ stopping \ criterion \ fulfilled, \ e.g. \ \|r_k\|_{\ell^2} \leq \varepsilon \, \|r_0\|_{\ell^2} \end{array}$

Algorithm 2: Method of steepest descent

 $\begin{array}{l} x_{0} \text{ given} \\ r_{0} = b - A x_{0} \\ k = 0 \\ \hline \mathbf{repeat} \\ & \left| \begin{array}{l} p_{k} = r_{k} \\ \alpha_{k} = \frac{(r_{k}, p_{k})}{(A p_{k}, p_{k})} \\ x_{k+1} = x_{k} + \alpha_{k} p_{k} \\ r_{k+1} = r_{k} - \alpha_{k} A p_{k} \\ k = k + 1 \\ \hline \mathbf{k} = k + 1 \\ \hline \mathbf{until stopping criterion fulfilled, e.g. } \|r_{k}\|_{\ell^{2}} \leq \varepsilon \|r_{0}\|_{\ell^{2}} \end{array} \right.$

Algorithm 3: Conjugate gradient method

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 \begin{aligned} x_0 & \text{given} \\ r_0 &= b - A x_0 \\ k &= 0 \\ \text{repeat} \\ & \text{if } k = 0 \text{ then} \\ & + p_k = r_k \\ \text{else} \\ & \left| \begin{array}{c} \beta_{k-1} &= -\frac{(r_k, A p_{k-1})}{(p_{k-1}, A p_{k-1})} \\ p_k &= r_k + \beta_{k-1} p_{k-1} \\ \text{end} \\ \alpha_k &= \frac{(r_k, p_k)}{(A p_k, p_k)} \\ x_{k+1} &= x_k + \alpha_k p_k \\ r_{k+1} &= r_k - \alpha_k A p_k \\ k &= k + 1 \\ \text{until stopping criterion fulfilled, e.g. } \|r_k\|_{\ell^2} \leq \varepsilon \|r_0\|_{\ell^2} \end{aligned}
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