

ALGORITHM 6.17: Conjugate Gradient

1. Compute $r_0 := b - Ax_0$, $p_0 := r_0$.
 2. For $j = 0, 1, \dots$, until convergence Do:
 3. $\alpha_j := (r_j, r_j) / (Ap_j, p_j)$
 4. $x_{j+1} := x_j + \alpha_j p_j$
 5. $r_{j+1} := r_j - \alpha_j Ap_j$
 6. $\beta_j := (r_{j+1}, r_{j+1}) / (r_j, r_j)$
 7. $p_{j+1} := r_{j+1} + \beta_j p_j$
 8. EndDo
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