

Errors (first printing, fixed in second printing)  
**Iterative Methods for Linear and Nonlinear Equations**  
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The 3rd printing should take place in late 1997 or early 1998. Please send me more errors!

- page *xiii* The directions for getting the software have been changed. The new version is:  
A collection of MATLAB codes has been written to accompany this book. The MATLAB codes can be obtained by anonymous ftp from the MathWorks server  
`ftp.mathworks.com`  
in the directory `pub/books/kelley`, from the MathWorks World Wide Web site,  
`http://www.mathworks.com`  
or from SIAM's World Wide Web site  
`http://www.siam.org/books/kelley/kelley.html`
- page 8 line 2, "The" should be "Then".
- page 14 The line below equation 2.7 should be changed to  
"We will refer to the polynomial  $\bar{p}_k$  as a *residual polynomial* [185]."  
and line 17 "We define the class of *residual polynomials* [185]." should be deleted.
- page 20 line 13 should read  
" $p_{k+1}$  satisfying (2.20) can, up to a scalar multiple, be expressed as"
- page 23 line 9, change  $y^*S^{-1}x^*$  to  $y^* = S^{-1}x^*$
- page 27 line 14, "an" should be "and"
- page 27 line 18 "reduction is" should be "reduction in"
- page 29 line 1, "than the" should be "as the"
- page 34 line 19, "is diagonalizable matrices and  $p$  is a polynomial" to "is a diagonalizable matrix and  $p$  is a polynomial then"
- page 35 line 15-6 Change "As the set of diagonalizable matrices are dense in the space of  $N \times N$  matrices" to  
"As the set of non-diagonalizable matrices has measure zero in the space of  $N \times N$  matrices"
- page 36 line -11 "the both" should be "both"
- page 36 line -7 "methods [8], [182] methods" should be "[8], [182] methods"
- page 36 line -5 "are can" should be "can"
- page 39 line -9, delete the word "implementation"
- page 42 line 3, change "other approaches" to "other ideas"
- page 42 line -11, change "floating point" to "floating point operations"
- page 45 In Algorithm 3.5.1 `gmres` step (f) ii should read ( $h_{kk}$  changed to  $h_{k,k}$ )

$$\nu = \sqrt{h_{k,k}^2 + h_{k+1,k}^2}$$

- page 45 step (f) iii should read ( $h_{k+1,k}$  changed to  $-h_{k+1,k}$ )

$$c_k = h_{k,k}/\nu, s_k = -h_{k+1,k}/\nu$$

- page 67 line 21, change  $\leq \gamma \|x_1 - x_0\|/(1 - \gamma)$  to  $\leq \|x_1 - x_0\|/(1 - \gamma)$  (*i. e.* delete the first  $\gamma$ )

- page 67 line 27 change  $\leq \gamma^{n+1}\|x_1 - x_0\|/(1 - \gamma)$  to  $\leq \gamma^n\|x_1 - x_0\|/(1 - \gamma)$
- page 76 line 8 (displayed equation has extra paren)  $\|F'(x_c)^{-1} - (F'(x_c) + \Delta(x_c))^{-1}\|$  should be  $\|F'(x_c)^{-1} - (F'(x_c) + \Delta(x_c))^{-1}\|$
- page 77 line -4 “for all” is repeated
- page 78 line 8  $\int_0^1 (F(x^*) - F(x^* + te_c))e_c dt$  should be (missing primes)  $\int_0^1 (F'(x^*) - F'(x^* + te_c))e_c dt$
- page 78 line -5 “ $y_j$ s” should be “ $y_j$ ’s”
- page 83 line 6  $\bar{K}(1 + \gamma\delta) = \eta < 1$  should be  $\bar{K}(1 + \gamma)\delta = \eta < 1$
- page 85 last line  $2^k$  should be  $2^n$  in both places.
- page 87 in equation (5.21)  $d\mu$  should be  $d\nu$ .
- page 92 first line of exercise 5.7.11, delete second instance of the word “that” and change “ $f'$  is Lipschitz continuous” to “ $f''$  is Lipschitz continuous”
- page 92 second line of exercise 5.7.11, change the word “that” to “then”
- page 97 line 1 “so that the” should be “so that”
- page 99 equation (6.9) should read (subscript \* missing from the norm in the middle term)  $\|e_{n+1}\|_* \leq \bar{\eta}\|e_n\|_* < \delta_*$
- page 101 Step 3 in Algorithm fdgmres should be changed from  $x_k = x_0 + V_k y^k$  to  $s = V_k y^k$
- page 102 line 6, “compliment” should be “complement”
- page 107 The circles in the figures failed to print.
- page 108 The circles in the figures failed to print.
- page 109 line 4  $x^{4.5}$  should be  $x^{4.5}$
- page 109 line -1 “the iteration for  $C = 20$  failed.” should be “the iteration for  $C = 20$  required more than 80 function evaluations to converge.”
- page 110 Change the statement problem 6.5.2 to  
Prove Proposition 6.1.1 by showing that if the standard assumptions hold,  $0 < \epsilon < 1$ , and  $x$  is sufficiently near  $x^*$  then

$$\|F(x)\|/(1 + \epsilon) \leq \|F'(x^*)e\| \leq (1 + \epsilon)\|F(x)\|.$$

- page 110 line -3 of exercise 6.5.9 Change  $2^{n-1}$  to  $2^{1-n}$
- page 114 line -9, change  $B_n = F'(x^*) - E_n \approx F'(x^*)$  to  $B_n = F'(x^*) + E_n \approx F'(x^*)$
- page 116 equation (7.11)  $-F(x_n) - F(x^*)s_n$  should be  $-F(x_n) - F'(x^*)s_n$
- page 117 lines 5–7, displayed equation, the = and the < should both be  $\leq$ . The correct equation is

$$\begin{aligned} \|\psi_{n+1}\|_2^2 &\leq \|\psi_n\|_2^2 - \theta_n(2 - \theta_n)(\eta_n^T \psi_n)^2 \\ &\leq \|\psi_n\|_2^2 - \hat{\theta}^2(\eta_n^T \psi_n)^2 \\ &\leq \|\psi_n\|_2^2. \end{aligned}$$

- page 117 line 12 “convegence” should be “convergence”
- page 117 line 18 = should be  $\leq$ .
- page 118 line 5  $\|e_n\|_2$  should be  $\sum_{n=0}^M \|e_n\|_2$
- page 118 line 12  $B_n = A - E_n$  should be  $B_n = A + E_n$
- page 118 line -6  $E_s$  should be  $E_c s$

- page 119 line 2 of Proposition 7.2.1 “such the” should be “such that the”  
 page 121 line 4 One copy of “The development of the proof is complicated.” should be deleted  
 page 121 line 11 “proved in earlier” should be “proved earlier”  
 page 124 The first sentence of Lemma 7.3.1 should be “Assume that the Broyden sequence  $(\{x_n\}, \{B_n\})$  for the data  $(F, x_0, B_0)$  exists.” (add the word “exists” to the end)  
 page 124 In equation 7.36  $C_0$  should be  $B_0$  in both places  
 page 125 Change line -7 to

$$s_n = -w + C_w w(v_{n-1}^T w) = w(-1 + C_w(C_w^{-1} - \|s_{n-1}\|_2))$$

- page 126 In equation 7.43 change  $\prod_{j=0}^n$  to  $\prod_{j=0}^{n-1}$   
 page 133 line 5 in exercise 7.5.10 should be (change in summation index from  $j$  to  $k$ )

$$(B_+)_{ij} = (B_c)_{ij} + \frac{(y - B_c s)_i s_j}{\sum_{k=i-1}^{i+1} s_k^2}$$

- page 135 line 15 “by thorough” should be “with”  
 page 137 The circles in the figures failed to print.  
 page 138 line 22 “based” should be “based on”  
 page 140 line 2, line 17, line 18, line 21 Change  $(1 + \bar{\eta})$  to  $(1 + \bar{\eta})^2$   
 page 140 line 11 Change  $m_f(1 + \bar{\eta})\|F(x_n)\|m_f$  to  $m_f(1 + \bar{\eta})\|F(x_n)\|$   
 page 140 line 13 Change  $|F(x_0)|$  to  $\|F(x_0)\|$   
 page 147 The circles in the figures failed to print.  
 page 148 The circles in the figures failed to print.  
 page 149 The circles in the figures failed to print.  
 page 150 The circles in the figures failed to print.  
 page 163 The title is Index, not “Author Index”. The last page of the index is missing. SIAM will send you a correct index upon email request to [service@siam.org](mailto:service@siam.org).