Corrections to second printing of Numerical Methods for Least Squares Problems

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Chapter 1

p. 3, l.-16: change "and $\mathcal{V}(z) = \mu\|b\|_2$" to
"Then if $V = \sigma^2 I$ we have $\mathcal{V}(z) = \sigma^2 f^T f = \sigma^2 \|f\|_2^2$"

Chapter 2

p. 49, l.21: $\sqrt{u}$ should be: $\sqrt{1/u}$

p. 75, l.11,12: change p to r $(4\times)$

p. 77, l. 2: should be: $T = L_{21}L_{11}^{-1}, \ldots$

p. 87, l. 12: should be: "is to take ..."

p. 87, l.-12: should be: "in $B^TB - \tau I$"

p. 113, l.-10: should be: $= (V_{22}^T,\ V_{12}^T)$."

p. 113, l.-9: should be: $\Pi = \Pi_I\, \tilde{\Pi}\, \Pi_I^T$"

Chapter 4

p. 168, l. -3: first component in b should be: 3

p. 184, l. 18: should be: $|a_i^T x - b_i|^2$.

p. 186, l. 6: should be: $\sigma_1 \geq \sigma_2 \geq 0$

Chapter 5

p. 188, l.-6: should be: $Ax - b = \hat{A}_2\bar{x}_2 - \hat{b}$.

p. 189, l. 5: should be: $\hat{A}_2 v = \bar{A}_2 v - \bar{A}_1 R_{11}^{-1} R_{12} v = 0$.

p. 203, l.17: change $E_{\mathcal{B}}$ and $E_{\mathcal{F}}$ to $E_{\mathcal{B}}^T$ and $E_{\mathcal{F}}^T$.

p. 203, l.20: should be: $\lambda = -U^T(d - UE_{\mathcal{B}}^T x)$.

p. 205, l.-3. should be: $\psi(x, \lambda) =$

p. 208, l.15. should be: with $C = I_n$ and

p. 208, l.-5. should be: is upper bidiagonal

p. 212, l.-3. should be:: $P_\mu = A(A^TA + \mu^2 I_n)^{-1}A^T = ...$

p. 213, l. 2 should be: ... $\sum_{i=1}^{n} \left(\frac{\mu^2 c_i}{\sigma_i^2 + \mu^2}\right)^2 + ...$

p. 213, l. 4 should be: ... $= m - n + \sum_{i=1}^{n} \frac{\mu^2}{\sigma_i^2 + \mu^2}$

p. 213, l. 7 should be: Eldén [272, 1984]

Chapter 6

p. 217, l.-15: should be: $p = \max_{i \le i \le n}(i - f_i(C))$.

p. 218, l. 16: should be: $\text{Env}(C) = \{(i,j) \mid f_i(C) \le j \le i\}$.

p. 225, l. 13–14: $C = \sum_{k=1}^{M} B_k^T B_k$.

We assume in the following that ...

p. 225, l. -10–11: Identifying the blocks in $A^TA = R^TR$, we find that

$$R_i^T R_i = A_i^T A_i, \qquad R_i^T S_i = A_i^T B_i, \quad i = 1, \ldots, M,$$

$$R_{M+1}^T R_{M+1} = C - \sum_{k=1}^{M} S_k^T S_k.$$

p. 246, l.-7: should be: its graph $G(A^TA)$

Chapter 7

p. 300, l.-10: rhs in (7.5.5) should be: $-C^T(b_2 - Cb_1)$

p. 303, l.-8: Section 2.5.1 should be: Section 2.6.2

p. 305, l.1: change to: ... in (7.6.2) (now with $U_1 = (u_1, \ldots, u_{n+1})$)

p. 309, l. 1: formula should be: $\|r_k\|_2 = \bar{\phi}_{k+1} = \beta_1 s_k s_{k-1} \cdots s_1$.

p. 309, l. 6: Algorithm 2.3.1 should be: Algorithm 2.3.2

p. 311, l. 14: should be: $(\beta_1 e_1, B_k) = P_{k+1}\Omega_k Q_{k+1}$

p. 311, l. -5: delete the sentence "The SVD of this matrix ..."

Chapter 8

p. 325, l. 11: should be: matrix $V \in \mathbf{R}^{m\times n}$

p. 338, l. 1 should be: where $D \in \mathbf{R}^{q\times n}$,

p. 338, l. 3: should be: $(A \otimes B)d = \mathrm{vec}(BDA^T)$

p. 338, l. 6: should be $= \mathrm{vec}(B^{-1}DA^{-T})$

p. 338, l. 9: should be: $= \mathrm{vec}(B^{\dagger}D(A^{\dagger})^T)$

Chapter 9

p. 343, Example 9.2.1: The point $x^* = 0$ is NOT a local minimizer for $\lambda \geq 1$, but it always is a critical point.

p. 346, l. -1: change $-$ to $+$ in displayed formula

p. 346, l.-5: change μ_k to μ_k^2

p. 347, l. 1, 2 : should read "and for large μ_k ... steepest descent direction $-J(x_k)^T r(x_k)$.

p. 347, l.-9: should be $\ldots - \|r(x_k) + p_k)\|_2^2 \ldots$

p. 349, l. 10: should be $(\Sigma_1^2 + V_1^T Q_k V_1)q_1 =$

p. 349, l.-19: should be maintain p close ...

p. 350, l. 17: should be $z_k = J(x_k)^T r(x_k) - J(x_{k-1})^T r(x_k)$

p. 350, l. 21: change y_k to z_k in equation (9.3.6)

p. 351, l. -8: should be: based on (9.4.3) ...

p. 352, l. -13: should be $B(z)y = \ldots$

p. 356, l. -8: change Q_2 to Q_1 in second formula.

p. 356, l. -1: change s_2 to s_1.