Errata

This is the new errata sheet for both hardbound and softcover editions of the text, as of 07/30/18. Errata that apply only to the hardbound edition are followed by "(H)" and those that apply to both are followed by "(H/S)".

Chapter 1:

(1) p. 8, Exercise 1.1.8: "Example 1.5" should be "Example 1.3".
(2) p. 10, Definition 1.3 of $A \cap B$: Change "or" to "and". (H/S)
(3) p. 12, Figure 1.4: Should have $a + bi = re^{i\theta}$ and $a - bi = e^{-i\theta}$. (H/S)
(4) p. 13, line -6: Replace "last" by "fifth". (H/S)
(5) p. 14, line 2: Replace "$i\,(x_1y_2 - x_2y_1)$" by "$i\,(x_1y_2 + x_2y_1)$". (H/S)
(6) p. 18, Example 1.14: In the solution replace "$-1 \pm i\frac{\sqrt{3}}{2}$" by "$-\frac{1}{2} \pm i\frac{\sqrt{3}}{2}$". (H/S)
(7) p. 19, Exercise 1.2.3(g): Answer should be πe^{0i}. (H/S)
(8) p. 20, Exercise 1.2.10(b): Problem should be $(2 + 4i) - (3 + 3i)$. (H/S)
(9) p. 30, Exercise 1.3.4(c): First equation should be $x_1 + x_2 = 1$. (H/S)
(10) p. 32, Exercise 1.3.13(c): Answer should be augmented matrix with three right-hand sides reduces to $\begin{bmatrix} 1 & 0 & 2 & -1 & 1 \\ 0 & 1 & 1 & -1 & -1 \end{bmatrix}$ giving solutions (a) $x_1 = 2$, $x_2 = 1$ (b) $x_1 = -1$, $x_2 = -1$ (c) $x_1 = 1$, $x_2 = -1$. (H/S)
(11) p. 42, Exercise 1.4.1(a),(g): Answer should be that leading entries are (a) $(1, 2)$ (g) $(1, 1)$, $(3, 3)$. (H/S)
(12) p. 43, Exercise 1.4.5(f): Answer should have sequence of elementary operations E_{12}, $E_{21}(-2)$, $E_{31}(-1)$, E_{23}, $E_2(-1)$, $E_{32}(3)$, $E_3\left(\frac{-1}{4}\right)$, $E_{23}(1)$, $E_{13}(-1)$, $E_{12}(-2)$. (H/S)
(13) p. 44, Exercise 1.4.9: Answer should be $0 \le \operatorname{rank}(A) < 3$. (H/S)
(14) p. 44, Exercise 1.4.11(b): First equation should read $x_1 + 2x_2 - x_3 = c$. (H/S)
(15) p. 44, Exercise 1.4.11(c): Answer should be "Inconsistent if c= -2, infinitely many solutions if $c = 1$, unique solution otherwise." (H/S)

Chapter 2:

(1) p. 68, line 10: Delete "$A =$" from "$A = I = \ldots$".(H/S)
(2) p. 68, Exercise 2.2.3(c): Answer should be $\begin{bmatrix} 1 & -3 \\ 0 & 2 \\ -1 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -1 \\ 0 \\ 0 \end{bmatrix}$.
(3) p. 69, Exercise 2.2.7(c): Answer should be $\begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & 3 \\ 0 & 1 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ -3x_2 \\ x_3 \end{bmatrix}$ or $\begin{bmatrix} 1 & 0 & 1 \\ 1 & -3 & 3 \\ 0 & -3 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$. (H/S)
(4) p. 69, Exercise 2.2.11: Answers should be $A^2 = \begin{bmatrix} -1 & -8 \\ 4 & 7 \end{bmatrix}$, $BA = \begin{bmatrix} 6 & 8 \end{bmatrix}$, $AC = \begin{bmatrix} -9 \\ 16 \end{bmatrix}$, $AD = \begin{bmatrix} 3 & -1 & -2 \\ -2 & 9 & 3 \end{bmatrix}$. (H/S)
(5) p. 70, Exercise 2.2.18: Replace $\mathbf{uv} + \mathbf{wu}$ by $\mathbf{uv} + \mathbf{wu}^T$. (H/S)
(6) p. 71, Exercises: Missing Problem 28: "Determine the flop count for multiplication of $m \times p$ matrix A by $p \times n$ matrix B. (See page 48.)" (H)

(7) p. 74, line 7: Replace "$A = \begin{bmatrix} \frac{3}{2} & 0 \\ 0 & frac12 \end{bmatrix}$" by "$A = \begin{bmatrix} \frac{3}{2} & 0 \\ 0 & \frac{1}{2} \end{bmatrix}$". (H/S) NP: 86
(8) p. 75, Figure 2.2(a), Replace "direction by 1." with "direction by $\frac{1}{2}$."
(9) p. 112, Exercise 2.5.5(e): Answer should be $E_2\left(\frac{1}{3}\right)E_1(-1)E_{21}(\mathrm{i})$. (H/S)
(10) p. 113, Problem 2.5.23: Replace "if A and B are invertible matrices" by "if A and B are matrices". (H/S)
(11) p. 114, Exercise 2.5.27: Replace "Exercise 26" by "Exercise 17". (H/S)
(12) p. 117, line 15: Replace "$A_{ij} = (-1)^{i+j} M(A)$" by "$A_{ij} = (-1)^{i+j} M_{ij}(A)$". (H/S)
(13) p. 125, line 9: Switch the variables x_1 and x_2 in the solution.(H/S)
(14) p. 131, Example 2.58, line -6: The matrix L should be $\begin{bmatrix} 1 & 0 & 0 \\ -1 & 1 & 0 \\ 1 & 2 & 1 \end{bmatrix}$.
(15) p. 137, line 2: Replace second row $-8, -2$ of $B \otimes A$ by $8, 4$. (H/S)
(16) p. 138, line 1: Replace "$IAX + (-I)XB$" by "$AXI + (-I)XB$". (H/S)
(17) p. 143, Exercise 2.7.6: Vectors should be listed as "$\mathbf{x}^{(0)}$", "$\mathbf{x}^{(1)}$", and "$\mathbf{x}^{(2)}$" . (H/S)

Chapter 3:

(1) p. 150, line 3: Change "((1 – 2i))" to "(1 – 2i))". (H/S) – NP 184
(2) p. 158, line 21: Change "$T(f((x))$" to "$T(f(x))$". (H/S)
(3) p. 180, Exercise 3.3.4: Change "$\mathbb{R}^3$" to "$\mathbb{R}^4$". (H/S)
(4) p. 182, Exercise 3.3.17: Answer should be $\begin{bmatrix} \frac{1}{2} & 0 \\ 0 & \frac{3}{2} \end{bmatrix}$. (H/S)
(5) p. 182, Exercise 3.3.18: Replace $\pi/4$ by $\pi/6$. (H/S)
(6) p. 198, Problem 3.5.22: Statement should be "Show that a set of vectors $\mathbf{v}_1, \mathbf{v}_2, \ldots, \mathbf{v}_n$ in the vector space V is a basis if and only if it has no redundant vectors and $\dim V \le n$. " (H/S)

Chapter 4:

(1) p. 219, line 2: Change "$= -6 - 3 + 3 =$" to "$= -6 - 3 + 9 =$".
(2) p. 219, line 11: Change "$(\mathbf{u} \cdot \mathbf{v})\mathbf{w} - (\mathbf{u} \cdot \mathbf{v})\mathbf{w}$" to "$(\mathbf{u} \cdot \mathbf{w})\mathbf{v} - (\mathbf{u} \cdot \mathbf{v})\mathbf{w}$". (H/S)
(3) p. 219, Exercise 4.1.3(a): Answer should be $-\frac{\sqrt{145}}{145}$. (H)
(4) p. 221, lines 19 and 22: Change "$\|\mathbf{u}\|$" and "$\|\mathbf{v}\|$" to "$\|\mathbf{u}\|^2$" and "$\|\mathbf{v}\|^2$". (H/S)
(5) p. 226, line 7: Change "$\dim \mathbf{a}^\perp = n$" to "$\dim \mathbf{a}^\perp = n - 1$". (H/S)
(6) p. 227, line -9: Sentence should be "It can be shown that if A is known, the errors in $\mathbf{b}$ are normally distributed, and the least squares solution unique, then it is an unbiased estimator of the true solution in the statistical sense." (H)
(7) p. 230, line -9: Change "... $\begin{bmatrix} 1 \\ -1 \end{bmatrix} \begin{bmatrix} 0 \\ 0 \\ 2 \end{bmatrix}$ ..." to "... $\begin{bmatrix} 1 \\ -1 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 2 \end{bmatrix}$ ...". (H/S)
(8) p. 231, Exercise 4.2.3(b): Vectors should be $(3,0,4)$, $(2,2,1)$. (H)
(9) p. 231, Exercise 4.2.5: Answers should be (a) $|\mathbf{u} \cdot \mathbf{v}| = 1 \le \|\mathbf{u}\|\,\|\mathbf{v}\| = \sqrt{15}$ (b) $|\mathbf{u} \cdot \mathbf{v}| = 19 \le \|\mathbf{u}\|\,\|\mathbf{v}\| = 2\sqrt{165}$ (c) $|\mathbf{u} \cdot \mathbf{v}| = 26 \le \|\mathbf{u}\|\,\|\mathbf{v}\| = 26$. (H/S)
(10) p. 231, Exercise 4.2.7(b): Replace $(1,1,1)$ by $(0,1,1)$. (H/S)

(11) p. 239, Figure 4.4: Vector marked "$H_{\mathbf{w}}$" should be "$H_{\mathbf{v}}\mathbf{w}$". (H/S)

(12) p. 241, Exercise 4.3.9(c): Answer should be $\begin{bmatrix} 1 & 0 \\ 0 & \mathrm{i} \end{bmatrix}$ (H/S)

(13) p. 244, Theorem 4.11: The correct statement should be "If $U_B \overset{S}{\to} V_C \overset{T}{\to} W_D$, then $[T \circ S]_{B,D} = [T]_{C,D}[S]_{B,C}$." Accordingly, the subscripts should be changed in the proof, i.e., second line of proof should have "$[T \circ S]_{B,D}\,[\mathbf{u}]_B = [(T \circ S)(\mathbf{u})]_D$", fourth line should have "$[T \circ S]_{B,D}\,[\mathbf{u}]_B = [(T \circ S)(\mathbf{u})]_D = [T(S(\mathbf{u}))]_D = [T(\mathbf{v})]_D$", sixth line should have "$[S(\mathbf{u})]_C = [S]_{B,C}\,[\mathbf{u}]_B$", seventh line should have "$[T \circ S]_{B,D}\,[\mathbf{u}]_B = [T]_{C,D}\,[\mathbf{v}]_C = [T]_{C,D}\,[S]_{B,C}\,[\mathbf{u}]_B$", and eighth should have "$\mathbf{e}_j = [\mathbf{u}]_B$". (H/S)

Chapter 5:

(1) p. 256, line 6: Replace "its" by "it's". (H/S)
(2) p. 258, line 7: Replace $\mathcal{E}_{1+\mathrm{i}}(A)$ by $\mathcal{E}_{1-\mathrm{i}}(A)$. (H/S)
(3) p. 262, Problem 5.1.15: Replace "ane" by "and". (H/S)
(4) p. 265, line -8: Delete $A\mathbf{x} =$ at start of displayed equation. (H/S)
(5) p. 267, line -5: "$\sin(\pi A) =$" should be "$\sin\left(\frac{\pi}{2}A\right) =$". (H/S)
(6) p. 270, Exercise 5.2.5: Replace "if $p(A) = 0$" by "if $q(A) = 0$". (H/S)
(7) p. 270, Exercise 5.2.5: Answer should be "True in every case. (a) and (c) satisfy $q(A) = 0$ and are diagonalizable, (b) and (d) are not diagonalizable and $q(A) \neq 0$. " (H/S)
(8) p. 275, line 12: Replace "$10A$" by "A". (H/S)
(9) p. 280, Exercise 5.3.1(d): Answer should be "1, dominant eigenvalue -1 ". (H/S)
(10) p. 280, Exercise 5.3.5(d): Answer should be that ergodic theorem only applies to it. (H)
(11) p. 280, Exercise 5.3.7: Answer should be "$\operatorname{diag}\{A, B\}$, where possibilities for A are $\operatorname{diag}\{J_1(2), J_1(1)\}$, $J_2(2)$ and possibilities for B are $\operatorname{diag}\{J_1(3), J_1(3), J_1(3)\}$, $\operatorname{diag}\{J_1(3), J_2(3)\}$, $\operatorname{diag}\{J_3(3)\}$". (H/S)
(12) p. 281, Exercise 5.3.11: "three state" should be "three stage". (H)
(13) p. 281, Exercise 5.3.12: The last sentence should read: "Compare the growth rate to a constant interest rate that closely matches the model." (H)
(14) p. 282, Problem 5.3.16: "choice of $a, b \in \mathbb{R}$." should be "choice of $a, b \in \mathbb{R}$ with $b \neq 0$." (H/S)
(15) p. 282, Problem 5.3.17: Promote Problem 17 and following up one number. Problem 17 is "Show that 1 is an eigenvalue for all stochastic matrices." (H)
(16) p. 284, line -9,-10: Replace "$\mathbf{v}_2^*$" by "$\widetilde{\mathbf{v}}_2$". (H/S)
(17) p. 286, Exercise 5.4.2(c): Blank $(3,3)$th entry of matrix should be 0. (H/S)
(18) p. 287, Exercise 5.4.9: Replace "$B = P \operatorname{diag}\left\{1, \sqrt{2}, 4\right\} P^T$" by "$B = P \operatorname{diag}\left\{1, \sqrt{2}, 2\right\} P^T$". (H/S)
(19) p. 288, proof of Theorem 5.14: Delete the repetition of the line beginning "Compute an eigenvalue …". Also, since "Exercise 5" did not appear in the final edition, prove that $H_{\mathbf{v}}\mathbf{w} = \mathbf{e}_1$ with $\mathbf{v} = \mathbf{w} - \mathbf{e}_1$, as follows: Check that $\mathbf{v}^*(\mathbf{w} + \mathbf{e}_1) = 0$, since $\mathbf{w} \cdot \mathbf{e}_1 = \mathbf{e}_1 \cdot \mathbf{w}$, since both dot products are real. Hence $H_{\mathbf{v}}(\mathbf{w} + \mathbf{e}_1) = \mathbf{w} + \mathbf{e}_1$. Then use the facts that $H_{\mathbf{v}}\mathbf{v} = -\mathbf{v}$ and $\mathbf{w} = \frac{1}{2}\{\mathbf{v} + (\mathbf{w} + \mathbf{e}_1)\}$ to deduce that $H_{\mathbf{v}}\mathbf{w} = \mathbf{e}_1$. (H/S)

(20) p. 292, line 9: replace "*right singular values*" by "*right singular vectors*". (H/S)

(21) p. 293, Exercise 5.6.1(c): Answer should be $U = E_{12}E_{13}$, $V = \begin{bmatrix} 0 & 1 & 0 \\ -\frac{\sqrt{5}}{5} & 0 & \frac{2\sqrt{5}}{5} \\ \frac{2\sqrt{5}}{5} & 0 & \frac{\sqrt{5}}{5} \end{bmatrix}$. (H/S)

Chapter 6:

(1) p. 310, line 11: Replace "$\begin{bmatrix} \frac{1}{n} \\ e^{-n} \end{bmatrix}$" by "$-\begin{bmatrix} \frac{1}{n} \\ e^{-n} \end{bmatrix}$". (H/S)

(2) p. 311, Exercise 6.1.3(a): Answer for infinity norm should be $\frac{1}{3}(1,-3,-1)$. (H/S)

(3) p. 314, line 7: Replace "$\int_0^1 f(x)^2\,dx$" by "$\int_a^b f(x)^2\,dx$". (H/S)

(4) p. 318, line -11: Replace "$\|1,-1/2\|_\infty^2$" with "$\|(1,-1/2)\|_\infty^2$". (H/S)

(5) p. 320, line 3: Replace "Another useful corollary" by "Another useful corollary to Theorem 6.5". (H/S)

(6) p. 320, Exercise 6.2.1: Answer for (a) should have $|\langle \mathbf{u},\mathbf{v}\rangle| = 46$, $\|\mathbf{u}\| = \sqrt{97}$, $\|\mathbf{v}\| = \sqrt{40}$ and $46 \le \sqrt{97}\sqrt{40} \approx 62.29$ and (b) should have $\|\mathbf{v}\| = \frac{1}{\sqrt{7}}$ and $\frac{1}{5} = 0.2 \le \frac{1}{\sqrt{3}}\frac{1}{\sqrt{7}} \approx 0.2182$. (H/S)

(7) p. 321, Exercise 6.2.3(b): Answers should be $\frac{7}{5}x^3$, $\frac{\sqrt{7}}{5}$, $x - \frac{7}{5}x^3$. (H/S)

(8) p. 331, Exercise 6.3.5(a): Answer for $\mathrm{proj}_V\,\mathbf{w}$ should be $\frac{1}{6}(23,-5,14)$. (H)

(9) p. 331, Exercise 6.3.9: Replace "$\mathbf{w}_1 = (-1,-1,1,1)$" by "$\mathbf{w}_1 = (-1,1,1,-1)$" . (H)

(10) p. 341, Exercise 6.4.8: Change "page 335" to "page 336". (H/S)

(11) p. 343, Theorem 6.15: Swap "$\|A\|_1$" of (1) with "$\|A\|_\infty$" of (2). (H/S)

(12) p. 345, line -10: Replace "$A^{-1}\left(I + A^{-1}\delta A\right)\delta\mathbf{x}$" by "$A\left(I + A^{-1}\delta A\right)\delta\mathbf{x}$".

(13) p. 347, Exercise 6.5.1(c): Answer should be $2\sqrt{17}$, 10, 10. (H/S)

(14) p. 347, Exercise 6.5.3: Change "$\delta\mathbf{A} = 0.05\mathbf{A}$" to "$\delta\mathbf{b} = 0.5\mathbf{b}$" (H/S)

(15) p. 347, Exercise 6.5.3: Answer should be "Calculate $c = \left\|A^{-1}\delta A\right\| = 0.05\,\|I_3\| = 0.05 < 1$, $\frac{\|\delta A\|}{\|A\|} = 0.05$, $\frac{\|\delta \mathbf{b}\|}{\|\mathbf{b}\|} = 0.5$, $\mathrm{cond}(A) \approx 6.7807$. Hence, $\frac{\|\delta\mathbf{x}\|}{\|\mathbf{x}\|} \approx 0.42857 < \frac{\mathrm{cond}(A)}{1-c}\left[\frac{\|\delta A\|}{\|A\|} + \frac{\|\delta \mathbf{b}\|}{\|\mathbf{b}\|}\right] \approx 1.7844$. " (H/S)

(16) p. 347, Problem 6.5.7: Statement should be "$\|A\|_1 = \max_{1\le j\le n}\left\{\sum_{i=1}^m |a_{ij}|\right\}$." (H/S)

(17) p. 354, Exercise 6.6.1: Answer for $\mathrm{cond}(A)\,\|\delta\mathbf{b}\|_\infty / \|\mathbf{b}\|_\infty$ should be 2.5873. (H/S)