Errata for the first edition

p. 4, Exercise 1.5: Replace "of degree n" by "of degree $\leq n$".

p. 10, Line 8: $B \in \mathbb{F}^{p\times q}$ to $B \in \mathbb{F}^{q\times p}$

p. 111, Line 2 of quote: Replace "its" by "it's".

p. 34, Exercise 2.15: The matrix in the hint is for $k < p$.

p. 39, Exercise 2.32: Exercise 2.4 to Example 2.3

p. 54, Line 9: $\widetilde{A}_5 A^{-1}$ to $\widetilde{A}_5$ is A^{-1}

p. 55, The third displayed formula: $-K_1 A_{11}$ to $-K_1 A_{12}$, twice.

p. 55, Lemma 3.7: $C \in \mathbb{F}^{p\times r}$ to $C \in \mathbb{F}^{r\times q}$ and $L \in \mathbb{F}^{r\times q}$ to $L \in \mathbb{F}^{p\times r}$

p. 59, Exercise 3.28: $A = \widetilde{B}C$ to $A\widetilde{B} = c$

p. 135, 10 up: $\sum_{kj=1}^{n}$ to $\sum_{j=1}^{n}$

p. 142 (7.20): The right hand side should read

$$\max\{\|S\mathbf{u}\|_\nu : \mathbf{u} \in \mathcal{U} \text{ and } \|\mathbf{u}\|_{\mathcal{U}} \leq \mathbf{1}\}$$

p. 146, Line 1: Delete $= \|A\|_{\infty,1}$ from (4).

p. 147, in (3) of Lemma 7.15: Add the assumption that $\|I_n\| = 1$.

p. 160, second line of (8.5): 1/2 to 1/4

p. 167, Lines -18 and -7: Replace "Appendix I" by "Appendix A"

p. 170, Lemma8.13: in a vector space $\mathcal{U}$ over $\mathbb{F}$ to of a vector space $\mathcal{U}$ over $\mathbb{F}$ into itself

p. 182, equation (8.34): The summation index should be s not t.

p. 192, line 5: $\mathbb{F}4$ to $\mathbb{F}^4$

p. 198, **COMMENT: Circulants are normal matrices.**

p. 220, Line 7 of the proof of Lemma 10.10: Replace

$$\begin{bmatrix} T_{11} \\ O \end{bmatrix} \quad \text{by} \quad \begin{bmatrix} T_{11}^H & O \end{bmatrix} \begin{bmatrix} T_{11} \\ O \end{bmatrix}$$

p. 211, Line 2: Lemma 10.4 to Lemma 10.3

p. 211, 3 up: Change the subscript $2,2$ to 2, twice.

p. 225, Exercise 10.24: Add: $\beta_1 \leq \cdots \leq \beta_n$ and $\gamma_1 \leq \cdots \leq \gamma_n$

p. 237, Line 4: a Moore-Penrose inverse to the Moore-Penrose inverse

p. 244, 11 up: eigenvectors to eigenvectors of A

p. 247, Formula (12.9): Delete the superscript $1/2$, twice; then $b_{11}^{-1/2}$ becomes b_{11}^{-1}.

p. 253, Line 3 of Lemma 12.8: Replace $|f(\zeta)| > 0$ by $f(\zeta) > 0$

p. 255, Line 3 of Lemma 12.11: $\mathbb{C}^{q\times p}$ to $\mathbb{C}^{p\times q}$

p. 257, (12.40): In the last matrix on the right in the second displayed line there is a column of zeros missing on the right.

p. 269, Line -14: Replace "Exercise 20.1" by 'Theorem 12.2"

p. 270, in (12.63): a_j^T to a_j^H

p. p.271, Exercise 12.59: It should be assumed that $A \neq O$ and $B \neq O$.

p. 273, equation (12.71): A left parenthesis is missing just before γ^2, in both formulas.

p. 278, Exercise 13.7: $\frac{A^k}{k!}$ to $\frac{A^j}{j!}$

p. 294, in the second line of the formula for $\varphi'(t)$: The symbol "det" is missing here and on the line following.

p. 298, Line 3 of Exercise 14.1: Replace β_{j+1} by α_{j+1}

p. 306, Exercises 14.5 and 14.7: Replace (14.11) by (14.9).

p. 312, 2 up: r_{A+B} to $r_\sigma(A+B)$

p. 324, Theorem 15.2: In the first displayed equation, replace $(\mathbf{u})^\circ$ by $(\mathbf{u}^\circ)$

p. 325, Line 1: A ")" is missing.

p. 327, Line −3: Replace J by $J_{\mathbf{f}}$

p. 331, 5 up: $\dfrac{\partial f_2}{\partial v}$ to $\dfrac{\partial f_2}{\partial \nu}$

p. 332, In the second line of the proof, replace $\dfrac{\partial f}{\partial \nu}$ by $\dfrac{\partial f}{\partial \nu} =$

p. 343, 9 up: add $q = n - p$

p. 345, Line 13: $\mathbb{C}^q$ to $\mathbb{R}^q$

p. 346. Line 2: $j = 2, \ldots$ to $j = 3, \ldots$

p. 347, Exercise 16.14: Replace "maximum" by "minimum".

p. 351, 3 up: $c_{\ell-2}A^{\ell-1}$ to $c_{\ell-1}A^{\ell-2}$

p. 352, 1 up: $\varphi(\mathbf{x})_k$ to $\varphi(\mathbf{x}_k)$

p. 353, Line 1: vector to unit vector

p. 356, Remark 16.16: Delete "and $\|f\| \leq 1$" on the left hand side of the first displayed equality, and delete "and $\mathbf{u} \in \mathcal{U}$" from the left hand side of the second displayed equality.

p. 358, in formula (17.6) the i should be in front of the fraction line and not on it. Also the two references to (17.6) just below (17.7) should be changed to (17.5).

p. 363, Theorem 17.7: Add the word "piecewise smooth" to the description of Γ.

p. 364, Line 6: $\lambda - \omega \in \Omega$ to $\lambda \in \Omega$

p. 364, 12 up: $\int_\gamma$ to $\int_\Gamma$

p. 371, Line −7: Replace "Paresaval" by "Parseval".

COMMENT: In Lemmas 17.16, 17.17, 17.18, 17.22, Corollary 17.23, Exercises 17.19 and 17.23, the constraint "smooth" can be relaxed to "piecewise smooth".

p. 373, Lemma 17.16: Add the word "closed" to the description of Γ.

p. 373, the first displayed matrix: $f_{qq}(\lambda)$ to $f_{pq}(\lambda)$

p. 375, Lemmas 17.17 and 17.18: Add the word "closed" to the description of Γ.

p. 377, Line -7: replace "the Jordan" by "a Jordan".

p. 382, formula (17.37): Replace dt by dx.

p. 387, 10 up: $\sigma(A) \cap \sigma(A^H)$ to $\sigma(A) \cap \sigma(-A^H)$

p. 397, Line 1 of the proof:

$$\begin{bmatrix} I_n & O \\ R^{-1}L^H & I_n \end{bmatrix} \quad \text{to} \quad \begin{bmatrix} I_n & O \\ R^{-1}L^H & I_k \end{bmatrix}$$

p. 399, Line 1 of the proof:

$$\varphi(t) = \frac{d}{ds}\{\mathbf{x}(s)^T X \mathbf{x}(s)\} \quad \text{to} \quad \varphi(s) = \mathbf{x}(s)^T X \mathbf{x}(s)$$

p. 399, Line 2 of the proof: $\varphi'(t)$ to $\varphi'(s)$

p. 403, Exercise 19.2:

$$A_3 = \begin{bmatrix} A_1 & -B_1C_2 \\ O & A_2 \end{bmatrix} \quad \text{to} \quad \begin{bmatrix} A_1 & B_1C_2 \\ O & A_2 \end{bmatrix}$$

p. 405, 1 up: $\mathcal{O}^H\mathcal{O}$ to $\mathfrak{O}^H\mathfrak{O}$

p. 406, Exercise 19.11: (A, B) is observable to (A, B) is controllable

p. 410, Exercise 19.15: Lemma 19.6 to Lemma 19.7

p. 412, Line 2: $= n$ to $= 5$

p. 422, 1 up: $X_1^H Q_1$ to $Q_1^H X_1$

p. 423, 10 up: $\mathcal{M}^\perp$ to $\mathcal{M}_1^\perp$

p. 429, Exercise 20.2: $\mathbf{u}_{k+1}$ to $\mathbf{u}_{j+1}$ and $\mathbf{v}_k$ to $\mathbf{v}_j$

p. 429, Line 5 of the proof: Y to $\mathcal{Y}$

p. 431, Line 3: $n \times m$ matrix to $n \times m$ matrix Q

p. 446, Line 2 of Theorem 20.21: $\mathbb{C}^n$ to $\mathbb{C}$

p. 450, (21.7): In the middle formula, the upper left hand block of the matrix should be changed to $-\widetilde{H_f}^{[0,k-1]}$.

p. 451, Corollary 21.2: Delete the word Hankel from both the statement and the proof of the corollary.

p. 452, Line -10: Replace "proof the" by "proof of the".

p. 452, one line below (21.13): proof to to proof of

p. 453, line 6: $\mathbf{e}_{j+1}$ to $\mathbf{e}_{j+1}^T$

p. 454, line 13: $0_{1\times(n-1)}$ to $0_{1\times(n-k)}$

p. 455, line 9: (see (21.12) to (see (21.12))

p. 458: **COMMENT. There is a much more efficient proof of the Barnett identity that is based on realization theory in the second edition of this book.**

p. 459, Lemma 21.13: $(\lambda)^n$ to λ^n (twice)

p. 459, Last two lines of the proof of Lemma 21.12: The proof $\cdots$ similar. to The second formula follows from the first, since $Z^2 = I_n$.

pp. 460–461, $B_{(f,g)}$ to $B(f,g)$ (3 times); $R_{(f,g)}$ to $R(f,g)$ (once)

p.463, Line 5: Replace $\widetilde{C}$ by $\widetilde{S}$

p. 463, line 2: Theorem 20.15 to Theorem 20.16

p. 463, line 5: $\widetilde{C}$ to $\widetilde{S}$

p. 473, Corollary 22.6: add the following phrase at the end of the first sentence: "such that $f(x) \geq \gamma > -\infty$ for every point $x \in Q$"

p. 479, add to the definition of support hyperplane: $H \cap \overline{Q} \neq \emptyset$, where $\overline{Q}$ denotes the closure of Q.

p. 483, in the discussion of Lemma 22.19, the symbol A refers to a nonempty compact convex subset of $\mathbb{R}^2$.

p. 489, Line 1 of Lemma 22.26: Replace "nonzero" by "unit".

p. 494, Line -4: Replace $\leq$ by $\preceq$

p. 497, in the definition of $\delta_A(\mathbf{x})$, $\mathbf{e}_i$ denotes the ith column of I_n.

p. 501, 9 up: $(\lambda I_n - A)_{ji}$ to $(\lambda I_n - A)_{\{ji\}}$

p. 500, Line -9: The right parenthesis should be level and not a subscript.

p. 501, Line -10: Replace $(\lambda I_n - A)_{ji}$ by $(\lambda I_n - A)_{\{ji\}}$

p. 503, Line -5: Replace $j, \ldots, n$ by $j = 1, \ldots, n$

p. 510, Lines 6 and 8: Replace $\widetilde{x}_1 = \cdots \widetilde{x}_k$ by $\widetilde{x}_1 + \cdots + \widetilde{x}_k$

p. 510, Line 4 of Exercise 23.24: The symbol $\geq$ should be added to the left of x_n and to the left of y_n.