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Mark W. Spong, Seth Hutchinson, M. Vidyasagar
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Errata

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Chapter 1

- Page 29: In the caption for Figure 1.25, change Problem 1-15 to Problem 1-13.

Chapter 2

- Bottom of page 43: the vectors x_1, x_2, and x_3 should be x_1^0, x_2^0, and x_3^0, respectively.

- Page 49: In the paragraph immediately before Example 2.5, change "We first rotate the frame $o_2 x_2 y_2 z_2$" to "We first rotate the frame $o_1 x_1 y_1 z_1$"

- Page 50: In Equation (2.18) the (1,2) element of the matrix $R_{z,\theta}$ should be $-s_\theta$.

- Equation (2.67), page 62: The (3,2) element of the matrix H_1^0 should be s_z.

Chapter 3

- First line in page 86: *. . . could just as well be placed at joint 2*, should read *. . . could just as well be placed at joint 1.*

- Page 87: The $(3, 2)$ element of the matrix A_5 should be $+1$.

- Page 91: In the expression for r_{11}, the term $-d_2$ should be $-s_1$.

- Page 92: In Figure 3.11, the placement of the base frame as shown will result in a nonzero value of d_1. One may either move the origin of the base frame such that d_1 is zero, or modify Table 3.5 and the subsequent matrices A_1 and T_4^0 to include a nonzero d_1.

- Page 109: Equation (3.70), T_4^1 should be T_4^0.

- Page 109: Equation (3.75), $\sqrt{1-c_2}$ should be $\sqrt{1-c_2^2}$.

Chapter 4

- Page 130: Equation (4.46), the summation $\sum_{i-1}^{n}$ should be $\sum_{i=1}^{n}$.

- Page 135: In the second sentence, the reference to Equation (4.62) should be Equation (4.63).

- Page 140: In the sentence before Equation (4.85), $R = R_{z,\psi}R_{y,\theta}R_{z,\phi}$ should be $R = R_{z,\phi}R_{y,\theta}R_{z,\psi}$.

- Page 143: In the second line after Equation (4.90), "that the all possible" should be "that all possible".

- Page 144: In the middle of the first paragraph, θ_4 should be θ_5.

- Page 144: In Equation (4.99) the sign of the determinant should be switched.

- Page 153: In Equation (4.121), $\xi^T(JJ^T)^{-1}\xi^T$ should be $\xi^T(JJ^T)^{-1}\xi$.

- Page 154: After Equation (4.124), $\lambda_1 \geq \lambda_2 \cdots \leq \lambda_m$ should be $\lambda_1 \geq \lambda_2 \cdots \geq \lambda_m$.

- Page 158: In problem 4-7, $\phi = \frac{\phi}{2}$ should be $\phi = \frac{\pi}{2}$.

- Page 159: In problem 4-10, the word "acts" should be "facts".

- Page 159: In problem 4-13, $R = R_{z,\psi}R_{y,\theta}R_{z,\phi}$ should be $R = R_{z,\phi}R_{y,\theta}R_{z,\psi}$.

Chapter 5

- Page 170: In Equation (5.2), ζ should be ζ_i.

- Page 175: After Equation (5.8), "inlcudes" should be "includes".

- Page 177: In the first equation, the term $(a_x \sin\theta - a_y \cos\theta)$ should be $(a_x \sin\theta + a_y \cos\theta)$.

- Page 178: In Example 5.7, the word "repuslive" should be "repulsive".

- Page 187: In the next-to-last paragraph, "near by" should be "nearby".

- Page 197: In Equation (5.28), $q(t_0)$ should be $q(t)$.

Chapter 7

- In Figure 7.2, the motor inertia should be labeled J_m and the link inertia should be labeled J_ℓ.

- Page 255: In equation (7.53) add the term $\frac{1}{2}$ before the last summation sign.

- Page 257: In Equation (7.64) change $\frac{\partial d_{kj}}{\partial q_j}$ to $\frac{\partial d_{kj}}{\partial q_i}$

- Page 261: In the first line, $I_i \omega_i^2$ should be $\frac{1}{2} I_i \omega_i^2$.

- Page 262: In the matrix in Equation (7.90) the (1,1) term should be $-\ell_1 \sin p_1$.

- Page 265: The first vector in Equation (7.99) should be $\begin{bmatrix} \ell_2 \cos q_2 \\ \ell_2 \sin q_2 \end{bmatrix}$.

- Page 266: In Equation (7.102), $\omega_3 = q_1 k$ should be $\omega_3 = \dot{q}_1 k$.

- Page 276: In Figure 7.12, the term $-R_i^{i+1} \tau_i$ should be $-R_{i+1}^i \tau_{i+1}$ and the term $-R_i^{i+1} f_{i+1}$ should be $-R_{i+1}^i f_{i+1}$.

- Page 277: In Equations (7.145) and (7.147), the term α_i should be $I \dot{\omega}_i$.

- Page 277: In the fourth line in the paragraph after Equation (7.147), "joint s" should be "joints".

- Page 278: In Equation (7.153), R_{i-1}^i should be R_i^{i-1}.

- Page 278: Equation (7.155) should be

$$a_{c,i}^{(0)} = a_{e,i-1}^{(0)} + \dot{\omega}_i^{(0)} \times r_{i,ci}^{(0)} + \omega_i^{(0)} \times (\omega_i^{(0)} \times r_{i,ci}^{(0)})$$

- Page 279: In the second-to-last paragraph the reference to Figure 7.9 should be to Figure 7.8.

- Page 279: In Equation (7.162), $\omega_2 = (q_1 + q_2)k$ should be $\omega_2 = (\dot{q}_1 + \dot{q}_2)k$

- Page 280: In Equations (7.163) and (7.164) the terms $(\ell_1 - \ell_{c1})$ and $(\ell_2 - \ell_{c2})$ should be $-(\ell_1 - \ell_{c1})$ and $-(\ell_2 - \ell_{c2})$, respectively.

- Page 280: In Equation (7.166) the term $\sin q_1$ should be $-\sin q_1$.

- Page 280: In Equation (7.168), the term $\alpha_{c,2}$ should be $a_{c,2}$ and R_1^2 should be R_2^1.

- Page 281: In Equation (7.169), R_1^2 should be R_2^1 and $\sin \dot{q}_2$ should be $\sin q_2$.

- Page 281: The vector in Equation (7.171) should have a third element equal to 0.

- Page 282: All occurrences of R_1^2 should be changed to R_2^1.

- Page 300: After Equation (8.45) the term $\tilde{(\cdot)} = (\cdot) - \hat{(\cdot)}$ should be changed to $\tilde{(\cdot)} - \hat{(\cdot)} - (\cdot)$

Chapter 9

- Page 330: In Equation (9.21), $K_d \tilde{+} F$ should be $K_d \tilde{x} + F$.

- Page 332: In Equation (9.27), $\frac{1}{m_c}$ should be $\frac{1}{M_c}$.

- Page 333: In Equation (9.33), $(\dot{x}^d - x)$ should be $(\dot{x} - \dot{x}^d)$.

Chapter 10

- Page 341: In Definition 10.1, change $f : M \to T_x M$ to $f : M \to TM$ and change

$$f(x) = \begin{bmatrix} f_1(x) \\ \vdots \\ f_m(x) \end{bmatrix}$$

  to

$$f(x) = \begin{bmatrix} f_1(x) \\ \vdots \\ f_m(x) \end{bmatrix} \in T_x M \text{ for all } x \in M$$

- Page 341: In Definition 10.2 change $T_x^* M$ to $T^* M$.

- Page 343: In Example 10.2, the third element of the vector $f(x)$ should be changed to $x_1 + x_3^2$.

- Page 352: Equation (10.49) should be

$$L_{ad_f^k}(g)T_1 = 0 \; k = 0, 1, \dots, n-2$$

- Page 352: Equation (10.50) should be

$$L_{ad_f^{n-1}}(g)T_1 \neq 0$$

- Page 353: In Equation (10.56) L should be changed to ℓ.

- Page 354: In Equation (10.57), L should be changed to ℓ.

- Page 354: In Equation (10.62), the left side of the last two terms should be changed to $L_{ad_f^2}(g)T_1$ and $L_{ad_f^3}(g)T_1$, respectively.

- Pages 355 and 356: All occurrences of MgL should be changed to $Mg\ell$.

- Page 359: In Equation (10.83) change $\dot{x}_1$ and $\dot{x}_3$ to x_1 and x_3, respectively.

- Page 359: In Equation (10.86), change $T_1(x_1)$ to $T_1(x)$ in the first equation.

- Page 362: Remove the semicolon in Equation (10.100).

- Page 367: After Equation (10.113), change g_2 *it follows* to g_2. *It follows.*

- Page 368: In the third sentence of Definition 10.11, change $\bar{\Delta}$ *is an involutive distribution such that* to $\bar{\Delta}$ *is an involutive distribution containing* Δ *such that*

- Page 375: In Problem 10-21 change rank 3 to rank 2.

Chapter 11

- Page 387: In the second paragraph, change "Likewise, if half or the pixels" to "Likewise, if half of the pixels".

Chapter 12

- Page 426: In the first row vector in Equation (12.21), change the first term L_{v_z} to L_{v_x}.

Appendix A

- Page 436: In the Law of Cosines, change ab^2 to b^2.

Appendix D

- Page 452: In Equation (D.7), change $x_i x_i$ to $x_i x_j$.