

Errata for  
Simulation of Dynamic Systems with MATLAB and Simulink  
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**Chapter 1 Mathematical Modeling**

- P 15 In Part c), change 0.9872 to 0.9875
- P 16 In TABLE 1.1, change " $N$ " to " $n$ "
- P 17 In Eq 1.36, change " $y(n+1)$ " to " $y(n-1)$ "
- P 19 In the line after  $y(3) = \alpha y(2) + A$ , change " $a$ " to " $\alpha$ "  
In the 2<sup>nd</sup> line after  $y(3) = \alpha y(2) + A$ , change " $a^2$ " to " $\alpha^2$ "
- P 23 In TABLE 1.3, change " $N$ " to " $n$ "  
In TABLE 1.3, change " $at=1$  Year" to " $\Delta t=1$  Year"
- P26 In Figure 1.15, change  $P_A(n+1)P_A(n-1)$  to  $P_A(n+1) - P_A(n-1)$

**Chapter 2 Continuous-time Systems**

- P 39 In Eqs 2.21 and 2.22, move  $\omega_n$  outside the square root sign
- P 44 In Figure 2.7, change " $Q_{in}, c_1(t)$ " to " $Q_{in}, c(t)$ "
- P 62 In Eq 2.111, change " $A_{\underline{x}}$ " to " $A\bar{x}$ " and " $B_{\underline{u}}$ " to " $B\bar{u}$ "
- P 76 2.155 should be on the same line as the equation for  $t_1$   
2.159 should be on the same line as the equation for  $t_2$   
2.160 should be on the same line as the equation for  $T(t)$   
2.161 should be on the same line as the equation for  $t_3$

**Chapter 3 Elementary Numerical Integration**

- P 93 Two lines after Eq 3.14, change the word "unit" to "unity"
- P 98 On the 2<sup>nd</sup> line below Figure 3.6,  
change "A general formula for  $x_A(n+1)$ " to "A general formula for  $x_A(n), n = 1, 2, 3, \dots$ "  
In Eq 3.30, change  $x_A(0)$  to  $x(0)$   
Change Eq 3.31 to  $x_A(n) = x(0) + T[u(0) + \dots + u(n-1)], n=1, 2, 3, \dots$   
In Eq 3.32, change upper limit of sum to  $n-1$

- P 99 In TABLE 3.1, headings "Forward Euler", "Backward Euler", and "Continuous-time" should be shifted one column to the right  
In TABLE 3.1, change " $N$ " to " $n$ "
- P 105 On the line above Eq 3.49, change "quadratic function" to "quadratic equation"
- P 110 On the first line of Part b), change " $n=0,1,2,3,\dots$ " to " $n=0,10,20,\dots,150$ "
- P 113 On the first line of the 3<sup>rd</sup> paragraph, change " $n=1-6000$ " to " $n=1$  to 6000"
- P 115 In Eq 3.92, change  $x_A(n+1)$  to  $\underline{x}_A(n+1)$
- P 123 In Figure 3.18, change " $L_1 = f[x_A(n), (n)]$ " to " $L_1 = f[x_A(n), u(n)]$ "  
In line above Eq 3.132, change "line segment with slope  $L_1$ " to "line segment  $L_1$ "
- P 128 In Part c), change subscript " $t=1$ " to " $t=T$ "
- P 132 In TABLE 3.6, change " $N$ " to " $n$ "
- P 141 In Eq 3.214, change " $(W - \gamma V)\bar{f}_C$ " to " $(W - \gamma V) - \bar{f}_C$ "

#### Chapter 4 Linear Systems Analysis

- P 186 Eq 4.250 should read  $\emptyset_{41}(s) = \frac{1}{\Delta(s)} [0.15(s^2 + 0.335s + 0.0208)]$
- P 203 In Eq 4.319, the denominator should be  $\{1 + [(2)(0.5)]^2\}^{1/2}$
- P 207 In Eq 4.332, change "currency" to " $\infty$ "
- P 220 In TABLE 4.4, change " $F(s) = \mathcal{L}\{f(t)\}$ " to " $F(s) = \mathcal{L}\{f(t)\}$ "  
In TABLE 4.4, last column, 2<sup>nd</sup> from bottom row, change " $e^{-2at}$ " to " $e^{-2aT}$ "
- P 224 In Figure 4.43, change  $n=0,2,4,\dots$  to  $k=0,2,4,\dots$
- P 225 In last paragraph, change "From TABLE 4.4" to "From Equations 4.357 and 4.358"
- P 228 In Eq 4.416, change " $\delta k$ " to " $\delta_k$ "
- P 232 In last paragraph, change "Converting  $A_1$  polar form" to "Converting  $A_1$  to polar form"
- P 236 In first line after Figure 4.44, change "Section 4.4.6" to "Section 4.6.3"
- P 239 In Eq 490, change to  $y_k - 2(1 - \zeta\omega_n T)y_{k-1} + [1 - 2\zeta\omega_n T + (\omega_n T)^2]y_{k-2} = K(\omega_n T)^2 u_{k-2}$
- P 242 In Eq 4.504, insert a "]" before " $y_{k-2}$ "
- P 250 In Eq 4.52, the equations should be  

$$x_{1,k+1} = x_{2,k}$$

$$x_{2,k+1} = x_{3,k}$$

$$x_{3,k+1} = -a_3 x_{1,k} - a_2 x_{2,k} - a_1 x_{3,k} + u_k$$

- P 253 On the 2<sup>nd</sup> line from the top, change " $\Phi_0$ " to " $\Phi_0 = I$ "  
On the 4<sup>th</sup> line from the top, change " $\Phi(z)$ " to " $\Phi_0 = I$ "
- P 259 In Eq 4.588, delete 2<sup>nd</sup> occurrence of "terms generated from  $\mathcal{Z}^{-1}\{U(z)\}$ "
- P 265 In Eq 4.630, the term in front of bracket should be  $(\sqrt{2})^k$
- P 267 In first paragraph, change "Section 4.4.7" to "Example 4.27 in Section 4.7.2"  
In 3<sup>rd</sup> paragraph, change "Section 4.4.7" to "Section 4.7.2"  
In Eq 4.640, change " $-12\zeta\omega_n T$ " to " $-1 + 2\zeta\omega_n T$ "
- P 283 In Figure 4.81, change both occurrences of " $u(t)$ " to " $y(t)$ " and " $u_k$ " to " $y_k$ "
- P 284 in Eq 4.691, delete the vertical bar at the end
- P 285 In Example 4.35, Part (b), change "Find  $|H(e^{j\omega_0 T})|$ " to "Find  $|H(e^{j\omega T})|$  and plot"
- P 286 At the end of Part (d), change " $|H(e^{j\omega_0 T})|$ " to " $|H(e^{j\omega T})|$ "

## Chapter 5 Simulink

- P 352 In the 2<sup>nd</sup> paragraph, change "Figure 5.16" to "Figure 5.18"  
In the paragraph after Eq 5.9, change " $\theta_{com}(t)$ " to " $v_{com}(t)$ "
- P 358 Matrix A is incorrect. The correct matrix is

$$A = \begin{bmatrix} 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ \frac{-(K_{fs} + K_{rs})}{M} & \frac{-(B_f + B_r)}{M} & \frac{K_{fs}}{M} & \frac{B_f}{M} & \frac{K_{rs}}{M} & \frac{B_r}{M} & \frac{K_{rs}L_r - K_{fs}L_f}{M} & \frac{B_rL_r - B_fL_f}{M} \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ \frac{K_{fs}}{M_f} & \frac{B_f}{M_f} & \frac{-(K_{fs} + K_{fr})}{M_f} & \frac{-B_f}{M_f} & 0 & 0 & \frac{K_{fs}L_f}{M_f} & \frac{B_fL_f}{M_f} \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ \frac{K_{rs}}{M_r} & \frac{B_r}{M_r} & 0 & 0 & \frac{-(K_{rs} + K_{fr})}{M_r} & \frac{-B_r}{M_r} & \frac{-K_{rs}L_r}{M_r} & \frac{-B_rL_r}{M_r} \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ \frac{K_{rs}L_r - K_{fs}L_f}{I} & \frac{B_rL_r - B_fL_f}{I} & \frac{K_{fs}L_f}{I} & \frac{B_fL_f}{I} & \frac{-K_{rs}L_r}{I} & \frac{-B_rL_r}{I} & \frac{-(K_{fs}L_f^2 + K_{rs}L_r^2)}{I} & \frac{-(B_fL_f^2 + B_rL_r^2)}{I} \end{bmatrix}$$

P 372 TABLES 5.1 and 5.2 headings are wrong. The corrected tables are

$e_1 \backslash \dot{x}_n$	$\leq SL + \Delta$	$> SL + \Delta$
$> 0$	$K_{1,a}$	0
$\leq 0$	$K_{1,d}$	$K_{1,d}$

TABLE 5.1 Function  $K_1(e_1, \dot{x}_n)$

$e_g \backslash \dot{x}_n$	$\leq SL + \Delta$	$> SL + \Delta$
$> 0$	$K_{g,d}$	$K_{g,d}$
$\leq 0$	$K_{g,a}$	0

TABLE 5.2 Function  $K_g(e_g, \dot{x}_n)$

P 381 In the first paragraph, change "Figure 2.38 " to "Figure 2.43 "

P 401 In Eq 5.86, change " $\ddot{x}_1(n+1)$ " to " $\dot{x}_1(n+1)$ "

P 431 In Eq 5.148, change " $f_{v_0}(u)$ " to " $f_{v_0}(v)$ "

P 432 In Figure 5.115, right above "Arrowdata2.mat", change "Pr(Hit)=0.2087" to "Pr(Hit)=0.2082"

P 433 In Figure 5.118, change " $u(0)$ " to " $\theta(0)$ " in each of the four graphs