Corrections: Essentials of Robust Control

Errors listed here appeared in the first printing. Most of those errors have been corrected in the recent printing except those with **.

Convention: Page $xx$ is denoted as $P_{xx}$. Line $xxx$ from the top of the page is denoted as $L_{xxx}$ while line $xx$ from the bottom of the page is denoted as $-L_{xx}$.

1. P$viii$, L5, ftp ee.lsu.edu should be ftp gate.ee.lsu.edu
2. P20, L1, $B = U_A^* A U_1$ should be $B = U_A^* A V_1$.
3. P38, -L9, at lease should be at least.
4. P42, -L6, left-unit eigenvectors should be left-unit eigenvectors such that $y_i^* x_i = 1$.
5. P43, problem 3.7, $G_3$ should be $G_1$, $G$ should be $G_3$.
6. ** P62, problem 4.3, $\pi$ should be $\pi I$.
7. P77, L2 and L3, $L = -lqr(A', C', \text{eye}(n), \text{eye}(p))$ and $L = -\text{place}(A', C', P_l)$ should be $L = -lqr(A', C', \text{eye}(n), \text{eye}(p))^\top$ and $L = -\text{place}(A', C', P_l)^\top$ (i.e., transposed).
8. P101, L12, $\|S(s)\|_\infty = \|B_p^{-1}(s)S(s)\|_\infty \geq |B_p^{-1}(z)S(z)| = |B_p^{-1}(z)|$
   should be $\|S(s)\|_\infty = \|B_p^{-1}(s)S(s)\|_\infty \geq |B_p^{-1}(z)S(z)|$
   (The last equality holds only when $z$ is a right half plane zero of $L$.)
9. P102, Problem 6.4, Design a controller should be design a lead or lag controller.
10. P102, Problem 6.6 should be restated as: Let $P = \frac{5}{(1-s)(s+2)}$. Design a lead or lag controller so that the system has at least 30° phase margin with loop gain ≥ 2 for any frequency $\omega \leq 0.1$ and the smallest possible bandwidth (or crossover frequency).
11. ** P114, L13-15, $L_2[-\infty, 0)$ should be $L_2(\infty, 0]$. 
12. ** P117, -L6, $\lambda_i(A_{11}) \leq 0$ should be $\text{Re}\lambda_i(A_{11}) \leq 0$.
13. ** P138, -L10, $M(jw_0) = U(jw)\Sigma(jw_0)V^*(jw_0)$ should be $M(jw_0) = U(jw_0)\Sigma(jw_0)V^*(jw_0)$.
14. P155, -L3, $y_1$ should be $y_2$.
15. P158, Figure 8.20 should be partially filled.
16. ** P161, L1, $N = \frac{2(s+1)}{(s+2)^2}$ should be $N = \frac{s+1}{(s+2)^2}$

17. P163, Problem 8.17, smallest should be largest.


19. P199, -L6,

$$\iff \mu_\Delta(M) \left( \begin{bmatrix} M_{11}/\alpha & M_{12}/\alpha \\ M_{21} & M_{22} \end{bmatrix} \right) = 1.$$  

Hence

$$\max_{\Delta \in \mathcal{B}\Delta_2} \mu_1(\mathcal{F}_\ell(M, \Delta_2)) = \left\{ \alpha : \mu_\Delta(M) \left( \begin{bmatrix} M_{11}/\alpha & M_{12}/\alpha \\ M_{21} & M_{22} \end{bmatrix} \right) = 1 \right\}.$$  

should be

$$\iff \mu_\Delta \left( \begin{bmatrix} M_{11}/\alpha & M_{12}/\alpha \\ M_{21} & M_{22} \end{bmatrix} \right) = 1.$$  

Hence

$$\max_{\Delta \in \mathcal{B}\Delta_2} \mu_1(\mathcal{F}_\ell(M, \Delta_2)) = \left\{ \alpha : \mu_\Delta \left( \begin{bmatrix} M_{11}/\alpha & M_{12}/\alpha \\ M_{21} & M_{22} \end{bmatrix} \right) = 1 \right\}.$$
20. P200, L2

\[ \alpha_{\text{max}} = \left\{ \alpha : \mu_{\Delta}(M) \left( \begin{bmatrix} \frac{A}{\alpha} & B/\alpha \\ C & D \end{bmatrix} \right) = 1 \right\} = 21.77. \]

should be

\[ \alpha_{\text{max}} = \left\{ \alpha : \mu_{\Delta} \left( \begin{bmatrix} A/\alpha & B/\alpha \\ C & D \end{bmatrix} \right) = 1 \right\} = 21.77. \]

21. P238, L12, follows immediately form .. should be follows immediately from ...

22. ** P239, L4, The equivalence between (ii) and (iv) is obvious should be The equivalence between (iii) and (iv) is obvious by noting the fact that \( A + BR^{-1}D^*C \)

is stable if \( \|G\|_{\infty} < \gamma \).

23. P239, L13, \( XBR^{-1}D^*C \) should be \( XBR^{-1}D^*C \).

24. P254, L11, at \( t \to \infty \) should be at \( t \to \infty \).

25. P268, Problems 13.4 and 13.6, \( P = 10(s + 2)/s(s + 1)^2 \) should be \( P = 10(s + 2)/(s + 1)^3 \).

26. P301, Problem 14.7, \( P = 10(s + 2)/s(s + 1)^2 \) should be \( P = 10(s + 2)/(s + 1)^3 \).

27. P377, -

12, \( ||\Delta(z)|| \) should be \( ||\Delta(z)||_{\infty} \).

28. P377 -L6, \((u_0, u_1, \ldots, u_{t-1})\) should be \(u = (u_0, u_1, \ldots, u_{t-1})\)

29. P382, L10, \( \rho_R(M\Delta) = \infty \) should be \( \rho_R(M\Delta) = 0 \).

30. P383, L3, “Since \( D \) is nonsingular and \( D^*D = D^2 \in \mathcal{D} \)” should be “Since \( D \) is nonsingular and \( D^*D \in \mathcal{D} \).”

31. P383, L17, “note that \( Q = Q^* \) and \( Q^*G = QG = GQ \)” should be “note that \( Q^*G = QG = GQ \).”