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 Pxx. Line xxx from the top of the page is denoted as $Lxxx$ while line xx from the bottom of the page is denoted as $-Lxx$.

1. Pviii, L5, ftp ee.lsu.edu should be ftp gate.ee.lsu.edu

2. P20, L1, $B = U_1^* A U_1$ should be $B = U_1^* A V_1$.

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, π should be πI.

7. P77, L2 and L3, $L = -lqr(A', C', eye(n), eye(p))$ and $L = -place(A', C', Pl)$ should be $L = -lqr(A', C', eye(n), eye(p))'$ and $L = -place(A', C', Pl)'$ (i.e., transposed).

8. P101, L12,

$$\|S(s)\|_\infty = \left\|B_p^{-1}(s)S(s)\right\|_\infty \geq |B_p^{-1}(z)S(z)| = |B_p^{-1}(z)|$$

should be

$$\|S(s)\|_\infty = \left\|B_p^{-1}(s)S(s)\right\|_\infty \geq |B_p^{-1}(z)S(z)|$$

(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 $P = \dfrac{5}{(1-s)(s+2)}$. 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, $\mathcal{L}_2[-\infty, 0)$ should be $\mathcal{L}_2(-\infty, 0]$.

12. $**$ P117, -L6, $\lambda_i(A_{11}) \leq 0$ should be $\mathrm{Re}\lambda_i(A_{11}) \leq 0$.

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.

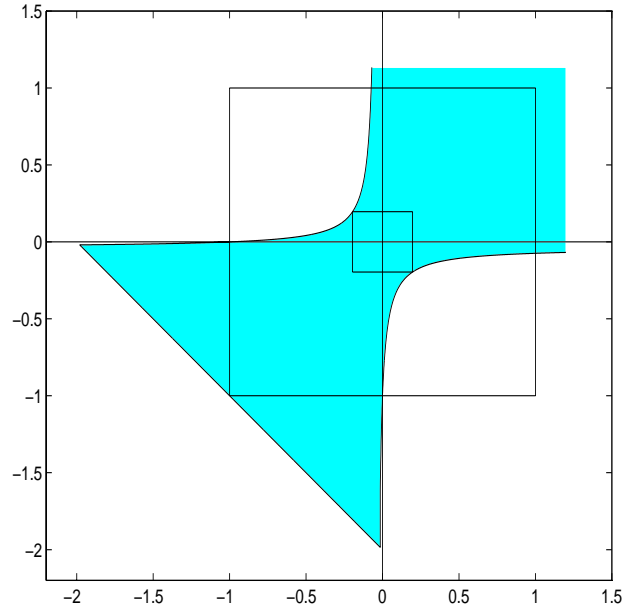15. P158, Figure 8.20 should be partially filled.

Figure 0.1: Stability region for $a = 5$

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.

18. P180, -L4, starp(P, K, dimy, dimu) should be starp(P, K).

19. P199, -L6,

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

Hence

$$\max_{\Delta_2 \in \mathbf{B}\boldsymbol{\Delta}_2} \mu_1 \left(\mathcal{F}_\ell (M, \Delta_2) \right) = \left\{ \alpha : \ \mu_{\boldsymbol{\Delta}}(M) \left(\begin{bmatrix} M_{11}/\alpha & M_{12}/\alpha \\ M_{21} & M_{22} \end{bmatrix} \right) = 1 \right\}.$$

should be

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

Hence

$$\max_{\Delta_2 \in \mathbf{B}\boldsymbol{\Delta}_2} \mu_1 \left(\mathcal{F}_\ell (M, \Delta_2) \right) = \left\{ \alpha : \ \mu_{\boldsymbol{\Delta}} \left(\begin{bmatrix} M_{11}/\alpha & M_{12}/\alpha \\ M_{21} & M_{22} \end{bmatrix} \right) = 1 \right\}.$$

20. P200, L2

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

should be

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

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 as $t \to \infty$.

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, $(u_0, u_1, \ldots, u_{l-1})$ should be $u = (u_0, u_1, \ldots, u_{l-1})$

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 $Q^*G = QG = GQ$".