Corrections of CSR Approach to H^∞-Control

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Convention: Page xx is denoted as Pxx. Line yy from the top of the page is denoted as Lyy while zz from the bottom of the page is denoted as $-Lzz$.

Chapter 1

???

Chapter 2

1. P30, -L2

$$= \quad \text{rank} \begin{bmatrix} I & L \\ 0 & V \end{bmatrix} \begin{bmatrix} A - \lambda I & B \\ C & D \end{bmatrix}$$

should be

$$= \quad \text{rank} \left(\begin{bmatrix} I & L \\ 0 & V \end{bmatrix} \begin{bmatrix} A - \lambda I & B \\ C & D \end{bmatrix} \right)$$

Chapter 3

1. P44, -L2 (3.38) should be (3.37)

Chapter 4

1. P82, L12 (??) should be (3.88)

2. P99, -L1

$$\begin{bmatrix} P & 0 \\ 0 & X_s \end{bmatrix} A_c + A_c^T \begin{bmatrix} P & 0 \\ 0 & X_s \end{bmatrix}$$
$$+ \left(C_c^T D_c + \begin{bmatrix} P & 0 \\ 0 & X_s \end{bmatrix} B_c \right) (I - D_c^T D_c)^{-1} \left(D_c^T C_c + B_c^T \begin{bmatrix} P & 0 \\ 0 & X_s \end{bmatrix} \right)$$
$$+ C_c^T C_c = 0.$$

should be

$$\begin{bmatrix} P & 0 \\ 0 & X_s \end{bmatrix} A_c + A_c^T \begin{bmatrix} P & 0 \\ 0 & X_s \end{bmatrix}$$
$$+ \left(C_c^T D_c + \begin{bmatrix} P & 0 \\ 0 & X_s \end{bmatrix} B_c \right) (I - D_c^T D_c)^{-1} \left(D_c^T C_c + B_c^T \begin{bmatrix} P & 0 \\ 0 & X_s \end{bmatrix} \right)$$
$$+ C_c^T C_c = 0.$$

Chapter 5

???

Chapter 6

1. P134, L14 $\Theta_+ J \Theta_+^{\sim} = J$ should be $\Theta_+^{\sim} J \Theta_+ = J$

2. P143, L3

$$\bar{X}\bar{A}^T + \bar{A}\bar{X} - \bar{X}C^T JC\bar{X} = 0,$$

should be

$$\bar{X}A^T + A\bar{X} - \bar{X}C^T JC\bar{X} = 0,$$

Chapter 7

???

Chapter 8

1. P192, -L7 $G = CHAIN(P)$ should be $G = CHAIN(P_o)$

2. P208, -L1

$$\begin{bmatrix} \Pi_{21}(s) & \Pi_{22}(s) \end{bmatrix} = U_w D_z \left[\begin{array}{c|cc} A + LC & B_u + LD_u & 0 \\ \hline (F + \hat{D}_y^{-1}\hat{C}_y)(I - \bar{X}X)^{-1} & \hat{D}_y^{-1} & \end{array}\right].$$

should be

$$\begin{bmatrix} \Pi_{21}(s) & \Pi_{22}(s) \end{bmatrix} = U_w D_z \left[\begin{array}{c|cc} A + LC & B_u + LD_u & 0 \\ \hline (F + \hat{D}_y^{-1}\hat{C}_y)(I - YX)^{-1} & \hat{D}_y^{-1} & \end{array}\right].$$

3. P212, L13

$$X(A - B_2 D_{12}^{-1} C_1) + (A - B_2 D_{12}^{-1} C_1)X - \frac{1}{\gamma^2} XB(D_z^T J_\gamma D_z)^{-1} B^T X = 0$$

should be

$$X(A - B_2 D_{12}^{-1} C_1) + (A - B_2 D_{12}^{-1} C_1)^T X - \frac{1}{\gamma^2} XB(D_z^T J_\gamma D_z)^{-1} B^T X = 0$$

4. P212, L15

$$F = \frac{1}{\gamma^2} \begin{bmatrix} -I \\ D_{12}^T D_{11} \end{bmatrix} (B_1^T - D_{11} D_{12}^{-T} B_2^T) X + \begin{bmatrix} 0 \\ D_{12}^{-1}(D_{12}^{-T} B_2^T X - C_1) \end{bmatrix}.$$

should be

$$F = \frac{1}{\gamma^2} \begin{bmatrix} -I \\ D_{12}^T D_{11} \end{bmatrix} (B_1^T - D_{11}^T D_{12}^{-T} B_2^T) X + \begin{bmatrix} 0 \\ D_{12}^{-1}(D_{12}^{-T} B_2^T X - C_1) \end{bmatrix}.$$

5. P213, L2

$$L = \tfrac{1}{\gamma^2} Y (C_1 - D_{11} D_{21}^{-1} C_2)^T \left[\begin{array}{cc} -I & D_{11} D_{21}^{-1} \end{array} \right] + \left[\begin{array}{cc} 0 & (Y C_2^T D_{21}^{-T} - B_1) D_{21}^{-1} \end{array} \right].$$

should be

$$L = \tfrac{1}{\gamma^2} Y (C_1 - D_{11} D_{21}^{-1} C_2)^T \left[\begin{array}{cc} I & -D_{11} D_{21}^{-1} \end{array} \right] + \left[\begin{array}{cc} 0 & (Y C_2^T D_{21}^{-T} - B_1) D_{21}^{-1} \end{array} \right].$$

6. P213, -L3

$$J_\gamma - D_w^T (D_w J_\gamma^{-1} D_w)^{-1} D_w = \left[\begin{array}{cc} 0 & 0 \\ 0 & D_{21}^T R_w D_{21} - I \end{array} \right] \quad ,$$

should be

$$J_\gamma - D_w^T (D_w J_\gamma^{-1} D_w^T)^{-1} D_w = \left[\begin{array}{cc} 0 & 0 \\ 0 & D_{21}^T R_w^{-1} D_{21} - I \end{array} \right] \quad ,$$

7. P214, -L1

$$\Pi_{11} = V_w \left[\begin{array}{c|cc} A + L_1 C_1 + L_2 C_2 & -(B_2 + L_z D_{12}) & L_y \\ \hline \left[\begin{array}{c} F_u \\ C_2 + D_{21} F_w \end{array} \right] (I - \frac{1}{\gamma^2} Y X) & I & 0 \\ & 0 & I \end{array} \right],$$

should be

$$\Pi_{11} = V_w \left[\begin{array}{c|cc} A + L_z C_1 + L_y C_2 & -(B_2 + L_z D_{12}) & L_y \\ \hline \left[\begin{array}{c} F_u \\ C_2 + D_{21} F_w \end{array} \right] (I - \frac{1}{\gamma^2} Y X)^{-1} & I & 0 \\ & 0 & I \end{array} \right],$$

8. P217, L3n

$$\Pi_{11} = V_w \left[\begin{array}{c|cc} A + L_z C_1 + L_y C_2 & -B_2 & L_y \\ \hline \left[\begin{array}{c} F_u \\ C_y \end{array} \right] (I - \frac{1}{\gamma^2} Y X) & I & 0 \\ & 0 & I \end{array} \right],$$

$$\Pi_{11}^{-1} = \left[\begin{array}{c|cc} A + B_1 F_w + B_2 F_u & (I - \gamma^{-2} Y X)^{-1} \left[\begin{array}{cc} B_2 & -L_y \end{array} \right] \\ \hline \begin{array}{c} F_u \\ C_y \end{array} & \begin{array}{cc} I & 0 \\ 0 & I \end{array} \end{array} \right] V_w^{-1},$$

should be

$$\Pi_{11} = V_w \left[\begin{array}{c|cc} A + L_z C_1 + L_y C_2 & -B_2 & L_y \\ \hline \left[\begin{array}{c} F_u \\ C_2 \end{array} \right] (I - \frac{1}{\gamma^2} Y X)^{-1} & I & 0 \\ & 0 & I \end{array} \right],$$

$$\Pi_{11}^{-1} = \left[\begin{array}{c|cc} A + B_1 F_w + B_2 F_u & (I - \gamma^{-2} Y X)^{-1} \left[\begin{array}{cc} B_2 & -L_y \end{array} \right] \\ \hline \begin{array}{c} F_u \\ C_2 \end{array} & \begin{array}{cc} I & 0 \\ 0 & I \end{array} \end{array} \right] V_w^{-1},$$

Chapter 9

1. P225, -L1 $w_0 = F_w\xi$ should be $w_0 = F_w x$

2. P226, L8

$$\begin{aligned}\dot{\xi} &= (A + B_1F_w + B_2F_u)\xi + \gamma U(B_2 + L_zD_{12})R_z^{-1/2}a \\ &\quad + UL_yR_w^{1/2}b, \\ u &= F_u\xi + \gamma R_z^{-1/2}a, \\ y &= (C_2 + D_{21}F_w)\xi - R_w^{1/2}b,\end{aligned}$$

should be

$$\begin{aligned}\dot{\xi} &= (A + B_1F_w + B_2F_u)\xi + U(B_2 + L_zD_{12})R_z^{-1/2}a \\ &\quad + \gamma UL_yR_w^{1/2}b, \\ u &= F_u\xi + R_z^{-1/2}a, \\ y &= (C_2 + D_{21}F_w)\xi - \gamma R_w^{1/2}b,\end{aligned}$$

3. P226, L10 (9.14) should be (9.15)

4. P226, L13

$$\begin{aligned}\dot{\xi} &= (A+B_1F_w+B_2F_u)\xi \\ &\quad + U\left[(B_2+L_zD_{12})\bar{S}(s)+L_y\right]\nu,\end{aligned}$$

should be

$$\begin{aligned}\dot{\xi} &= (A+B_1F_w+B_2F_u)\xi \\ &\quad + U\left[(B_2+L_zD_{12})\bar{S}(s)-L_y\right]\nu,\end{aligned}$$

5. P226, -L7 $\bar{S}; = \gamma R_z^{-1/2}S(s)R_w^{-1/2}$ should be $\bar{S} := -\gamma^{-1}R_z^{-1/2}S(s)R_w^{-1/2}$

6. P227, -L6

$$\begin{aligned}\dot{x} &= (A + B_1F_w)x + B_2u, \\ y &= (C_2 + D_{12}F_w)x.\end{aligned}$$

should be

$$\begin{aligned}\dot{x} &= (A + B_1F_w)x + B_2u, \\ y &= (C_2 + D_{21}F_w)x.\end{aligned}$$

7. P229, L16, (or(8.138)) should be (or(8.122))