

Errata for *Auxiliary Signal Design for Failure Detection**

Updated on Jan. 17, 2007

Page 28: In formula (2.3.11) of Theorem 2.3.1, y should be replaced by $y - Du$. If $D \neq 0$, then this alters (2.3.12), (2.3.15), (2.3.17), and (2.3.19) accordingly. This change does not continue into the next section as shown by (2.3.35).

Page 32: Just after (2.3.32), it should read $R = \begin{pmatrix} NN^T & NJ^T \\ JN^T & JJ^T - I \end{pmatrix}$ instead of $\begin{pmatrix} NN^T & NJ^T \\ JN^T & -I \end{pmatrix}$. Note, however, that the usual starting point for most of the applications is (2.3.25) and (2.3.26) and in these problems $J = 0$.

Page 83: There is a 2 missing from the lefthand side of (3.3.38d) and (3.3.38e). However, if we let $\eta = \hat{\eta}$, $\lambda = \hat{\lambda}$ in (3.3.38c)-(3.3.38e) and then divide these three equations by 2, we get a new system in $x, v, \nu, \hat{\eta}, \hat{\lambda}$ which is identical to (3.3.38). Since the rest of the development is self-contained, we get that using (3.3.38) and the formulas derived from it are still correct.

Page 87: In (3.3.57) the right hand side should be multiplied by $(\mathcal{N} \mathcal{D})$ on the left. The code on page 188 is correct and has this term in it. See the line starting $\mathbf{0m} =$, third line from the bottom.

Page 88: In (3.3.59c), $\begin{pmatrix} D_0 & 0 \\ 0 & D_1 \end{pmatrix} v$ should be $\begin{pmatrix} D_0 \\ D_1 \end{pmatrix} v$.

Page 129, 131 The initial λ boundary conditions are missing a 2 and should be $\lambda(0) + \hat{P}_\beta x(0) = 0$. This formulation is taken from [2]. She used a slightly different notation which absorbed the factor 2 so her formulation which also has no 2 is correct.

Page 139: Figure 4.2.4 is from [1]. Kirk was interested in examining how the shape changed so the test signals were normalized to make them have comparable. The shapes in Figure 4.2.4 are correct but the left graph in Figure 4.2.4 needs to be multiplied by $\|v^*\| = 1/\sqrt{\lambda^*}$ which will make it much larger.

Page 189: Entry for Page 22 should be “Same as $(E_\perp)^T$.”

NOTE: Both thesis are available from the NCSU libraries.

*With a special thanks to Dongkyoung Choe and Ivan Andjelkovic.

References

- [1] K. Horton, *Fault Diagnosis and Model Identification in Linear Descriptor Systems*, PhD Thesis, Operations Research Program, North Carolina State University, 2001.
- [2] K. Drake, *Analysis of Numerical Methods for Fault Diagnosis and Model Identification in Linear Systems with Delays*, PhD Thesis, Applied Mathematics, North Carolina State University, 2003.