If you find errors of any kind, please let us know. ‘Adaptive systems: an introduction’: Errata.

September 28, 1999

1. p17, Figure 1.4. The summation/subtraction circle and the C block in the lower left corner should be interchanged.

2. p18, (1.22), second line should be \( \zeta_c = A_c \zeta_c - b_c c_p \zeta_p \).

3. p18, (1.23), last line should be \( c = A c c - b c c_p p_p \).

4. p18, Remark 1.4.7. \( T_p(\xi) = C(\xi) Z_p(\xi) / (1 + C(\xi) Z_p(\xi)) \) should be \( T_p(\xi) = Z_p(\xi) / (1 + C(\xi) Z_p(\xi)) \) and \( T_m(\xi) = C(\xi) Z_m(\xi) / (1 + C(\xi) Z_m(\xi)) \) should be \( T_m(\xi) = Z_m(\xi) / (1 + C(\xi) Z_m(\xi)) \).

5. p29, (2.9) should read:

\[
\begin{align*}
y(k) = & \begin{cases} 
  c_1 + c_2 (-1)^k + \sum_{j=0}^{k-1} u(j) & k \geq 1 \\
  c_1 + c_2 & k = 0 \\
  c_1 + c_2 (-1)^k - \sum_{j=k}^{-1} u(j) & k \leq -1
\end{cases}
\end{align*}
\]

and (2.10):

\[
(u, y) \in \mathcal{B}_2 \iff \exists c \in \mathbb{R} \forall k \in \mathbb{Z} : y(k) = \begin{cases} 
  c + \sum_{j=0}^{k-1} u(j) & k \geq 1 \\
  c & k = 0 \\
  c - \sum_{j=k}^{-1} u(j) & k \leq -1
\end{cases}
\]

6. p30: In the proof of Theorem 2.3.3: \( y(0) = \cdots = y(i-1) = 0 \) should be \( y(0) = \cdots = y(n-i-1) = 0 \).

7. p32: Theorem 2.5.3 (1). The inclusion should be reversed: \( \mathcal{B}_2 \subset \mathcal{B}_1 \).

8. p35, Theorem 2.6.6: the polynomial \( \pi \) should not contain negative powers of \( \xi \). Also with ‘degree’ we mean the classical degree: the highest power in \( \xi \) that occurs.

9. p38, Theorem 2.8.2., the factorization should contain a non-zero factor: \( d(\xi, \xi^{-1}) = c \prod_{i=1}^{N} (\xi - \lambda_i)^{n_i}, \ c \neq 0 \).

10. p53, equation (3.5): \( D(\sigma) \phi^T \) should be \( \sigma^n D(\sigma) \phi^T \).

11. p55, formula above Remark 3.2.7: \( H(\sigma) \) should be \( \frac{H(\sigma)}{\sigma} \).

12. p59, 3rd line from below: \( k \) should be \( k + 1 \).

13. p63, (3.29) The term \( \phi(k) z(k) \) should be \( \frac{\phi(k) z(k)}{\phi(k)^+ \phi(k)} \).

14. p72, (3.43b): The expressions between norm signs \( \| \) should both be squared.

15. p75, (3.52): The expressions between norm signs \( \| \) should both be squared.

16. \( -1 < \rho < 1 \) should be \( 0 < \rho < 1 \).
17. p101, Exercise 3.13, $\theta_0$ should be $\theta^0$.
18. p129, last line of (4.98): $\tilde{e}(k)$ should be $e(k)$.
19. p130, (4.102b) $z(0) = 0$ causes problems (division by zero) when using the projection algorithm. Any non-zero initial state avoids that problem.
20. p130/131, (4.102d,e): In the right hand side $[\hat{b}(k) \quad \hat{l}(k)]$ should be replaced by $[\hat{b}(k)^T \quad \hat{l}(k)^T]$.
21. p136, Exercise 1a: Corollary 2.5.3 should be Cor. 2.6.5
22. p136, Exercise 1b: (4.152) should be (4.15).
23. p136, Exercise 4.5: (4.18) should be (4.3f).
24. p136, Exercise 4.6b: ‘same multiplicity’ should be ‘at least the same multiplicity’.
25. p174, Theorem 6.2.1. The co-domain of $f$ should be $\mathbb{R}^n$.
26. p188, (6.68): $c$ should be $\tilde{c}$.
27. p190, Theorem 6.4.9, second line: ‘for all $(k_0, z_0)$’ should read ‘for all $(k_0, x_0)$’.
28. p200, (6.112): the numerator should be $b_p(s)$ rather than $b_q(s)$.
29. p202, Exercise 6.8: $s(k)$ should be: $\sin(p_1 + k)$.
30. p211, first line: missing closing bracket for reference to (7.22).
31. p212, (7.30), third line: $A(\xi)$ should be $A^0(\xi)$.
32. p228: Reference to Section 7.2 should be 7.3
33. In (4.22) and (4.23) the transpositions in the l.h.s.’s should be deleted.
34. p263, second line $g_1 = g_0 K_p$ should read $g_1 = g_0$.
35. p265, (8.106) should read:

$$g_1 = \lim_{N \to \infty} \frac{1}{N} \sum_{k=1}^{N} c_m x_m(k) c_p x_p^0(k)/(\nu K_p)$$

$$= \lim_{N \to \infty} \frac{1}{N} \sum_{k=1}^{N} c_m x_m^{ss}(k) c_p x_p^{ss,0}(k)/(\nu K_p)$$

$$= \frac{1}{2} \Re \{ \sum_{l=1} Z_m(\lambda_l) Z_p(\lambda_l^*) |\rho_l|^2 \}$$

36. p266, Theorem 8.5.3, third line: $Z_p(\xi) = ...$ should be $Z_m(\xi) = ....$
37. Exercise 8.2. In the definition of sin there is an ‘i’ missing in the denominator.
38. p314, (A.17) should read:

$$R = ARA^T + I - K(CRC^T + I)K^T$$
39. p318, (A.32) should read:

\[
\int_{t_0}^{t} x^T(\tau)x(\tau)d\tau \leq \frac{\rho_{\max}}{\lambda_{\min}} x^T(t_0)x(t_0) + \frac{\mu_{\max}}{\lambda_{\min}} \int_{t_0}^{t} u^T(\tau)u(\tau)d\tau.
\]

where \(\rho_{\max}\) is the largest eigenvalue of \(P\). The constant \(C_0\) changes accordingly:

\[
C_0 = \frac{\rho_{\max}}{\lambda_{\min}}
\]