

ERRATA: *An Introduction to Mathematical Biology* L. J. S. Allen

Errata Chapter 2:

Theorem 2.13 (Jury conditions, Schur-Cohn criteria). *Suppose the characteristic polynomial,*

$$p(\lambda) = \lambda^n + a_1\lambda^{n-1} + a_2\lambda^{n-2} + \cdots + a_{n-1}\lambda + a_n = 0, \quad (1)$$

has real coefficients. Define two $(n-1) \times (n-1)$ matrices B_{n-1}^\pm as follows:

$$B_{n-1}^\pm = \begin{pmatrix} 1 & a_1 & a_2 & \cdots & a_{n-2} \\ 0 & 1 & a_2 & \cdots & a_{n-3} \\ 0 & 0 & 1 & \cdots & a_{n-4} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & 0 & \cdots & 1 \end{pmatrix} \pm \begin{pmatrix} 0 & 0 & 0 & \cdots & a_n \\ \vdots & \vdots & \vdots & \cdots & \vdots \\ 0 & 0 & a_n & \cdots & a_4 \\ 0 & a_n & a_{n-1} & \cdots & a_3 \\ a_n & a_{n-1} & a_{n-2} & \cdots & a_2 \end{pmatrix}.$$

Then the solutions λ of (1) satisfy $|\lambda| < 1$ iff the following three conditions hold:

- (i) $p(1) > 0$,*
- (ii) $(-1)^n p(-1) > 0$, and*
- (iii) the determinants of B_{n-1}^\pm and each of the inner matrices of B_{n-1}^\pm are positive.*

Errata Chapter 7:

Examples 7.2 and 7.3 come from Farlow (1982).

Note that time starts at $t = 1$ (Farlow, 1982).