An Introduction to Time Series Modeling by Andreas Jakobsson

Errata: 151228

Below is a list of corrections/typos found so far:

- p. 26, in lemma 2.1, both a and b are assumed to be *real-valued* deterministic constants.
- p. 32, first line, missing transpose. The sentence should read "thus lying in the (left) *null space* of $\mathbf{x}$, i.e., $\mathbf{e} \in \mathcal{N}(\mathbf{x}^T)$".
- p. 33, missing transposes: the vectors in Theorem 2.3 should be defined as $\mathbf{z} = \begin{bmatrix} \mathbf{x}^T & \mathbf{y}^T \end{bmatrix}^T$ and $E\{\mathbf{z}\} = \begin{bmatrix} \mathbf{m}_{\mathbf{x}}^T & \mathbf{m}_{\mathbf{y}}^T \end{bmatrix}^T$.
- p. 42, eq. (3.17), should read $r_{x,y}(t_1, t_2) = r_{x,y}(t_1 - t_2, 0) \stackrel{\triangle}{=} r_{x,y}(\tau)$, with $\tau = t_1 - t_2$.
- p. 46, eq (3.34), missing a term in the last equality, the equation should read:

$$\begin{aligned} E\{r_y^b(k)\} = \frac{1}{N} E\{\psi_k\} &= \frac{N-k}{N} \left(r_y(k) - V\{\hat{m}_y\} \right) \\ &= r_y(k) - \frac{k}{N} r_y(k) - \frac{N-k}{N} V\{\hat{m}_y\} \end{aligned}$$

- p. 59, above (3.87), the variable substitution should be $m = t - \ell$.
- p. 120, last line, wrong sign, $\nabla\nabla_{12} y_t = (1 - c_1 z^{-1})(1 - c_{12} z^{-12}) e_t$.
- p. 130, just above (4.46), the text *indexExample!Voiced speech* should be removed.
- p. 139, eq. (4.70), should read $w_t = A(z)\nabla x_t$.
- p. 152, missing conjugate transpose; (5.52) should read:

$$\mathbf{X} = \begin{bmatrix} \mathbf{x}_{p+1} & \dots & \mathbf{x}_N \end{bmatrix}^*$$

- p. 166, typos in formula. Eq (5.15) should read

$$\Big[\mathbf{I}_{\boldsymbol{\theta}}\Big]_{k,\ell} = \left[\frac{\partial \mathbf{m}_{\boldsymbol{\theta}}}{\partial \boldsymbol{\theta}_k}\right]^T \boldsymbol{\Sigma}_{\boldsymbol{\theta}}^{-1} \left[\frac{\partial \mathbf{m}_{\boldsymbol{\theta}}}{\partial \boldsymbol{\theta}_\ell}\right] + \frac{1}{2}\mathrm{tr}\left\{\boldsymbol{\Sigma}_{\boldsymbol{\theta}}^{-1} \frac{\partial \boldsymbol{\Sigma}_{\boldsymbol{\theta}}}{\partial \boldsymbol{\theta}_k} \boldsymbol{\Sigma}_{\boldsymbol{\theta}}^{-1} \frac{\partial \boldsymbol{\Sigma}_{\boldsymbol{\theta}}}{\partial \boldsymbol{\theta}_\ell}\right\}$$

- p. 180, Figure 5.5(a) should appear as in Figure 1.1(a), on the next page.

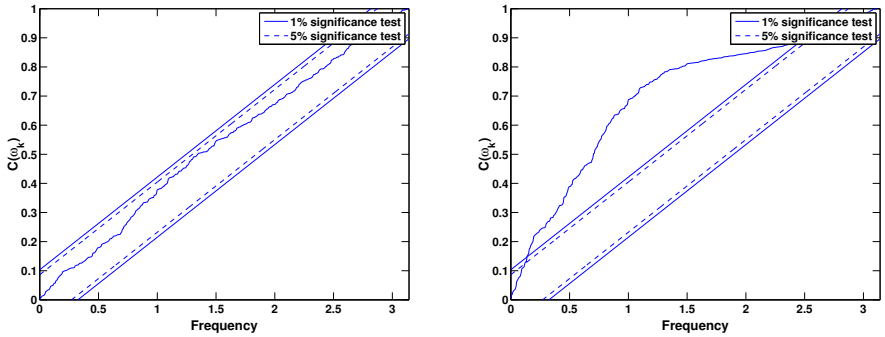

Figure 1.1: Cumulative periodogram test for (a) a white noise, and (b) for an AR process, with the corresponding 1% and 5% confidence intervals.

- p. 243, the dimension of $\mathbf{y}_t$ should be m, not p, in the equation at the top of the page, reading

$$f(\mathbf{Y}) = \prod_{t=1}^{N} \Big[(2\pi)^m \det(\mathbf{\Sigma}) \Big]^{-1/2} \exp\left\{ -\frac{1}{2} [\mathbf{y}_t - \mathbf{X}\boldsymbol{\theta}]^T \mathbf{\Sigma}^{-1} [\mathbf{y}_t - \mathbf{X}\boldsymbol{\theta}] \right\}$$
$$= \Big[(2\pi)^m \det(\mathbf{\Sigma}) \Big]^{-N/2} \exp\left\{ -\frac{1}{2} \sum_{t=1}^{N} [\mathbf{y}_t - \mathbf{X}\boldsymbol{\theta}]^T \mathbf{\Sigma}^{-1} [\mathbf{y}_t - \mathbf{X}\boldsymbol{\theta}] \right\}$$

- p. 253, Problem 7.1, §$E\{\hat{\mathbf{\Sigma}}_\mathbf{y}\}$ should read $E\{\hat{\mathbf{\Sigma}}_\mathbf{y}\}$.
- p. 254, Table 7.5, p in the first column should be ordered from 1 to 5, not 0 to 4. The same in table D.4 in the solution on p. 341.
- p. 268, example 8.4. There are errors in this example; it will be removed.
- p. 280, eq (8.148), the last time indices are missing. It should read:

$$\hat{\mathbf{y}}_{t+k|t} = \mathbf{C}\hat{\mathbf{x}}_{t+k|t} = \mathbf{C}\mathbf{A}^k \hat{\mathbf{x}}_{t|t}$$

- p. 289, line 2, the size of $\mathbf{A}$ should be $\mathbf{A} \in \mathbb{C}^{m \times m}$.
- p. 303, solution 3.1, missing minus sign. In the second and third line, it should read $\omega_0(t-k)$ and $-\omega_0 k$, respectively.
- p. 314, solution 3.14, sign error. The first equation should read:

$$r_z(\tau) = C\{x_t + y_t, x_{t-\tau} + y_{t-\tau}\} = r_x(\tau) + r_y(\tau)$$

- p. 317, solution 4.4, sign error. The second equation should read:

$$r_y(\tau) = E\left\{ \Big(x_t - x_{t-S} \Big) \Big(x_{t-\tau} - x_{t-\tau-S} \Big) \right\}$$
$$= 2r_x(\tau) - r_x(\tau + S) - r_x(\tau - S)$$

- p. 328, solution 5.9, missing square in fourth equation. It should read:

$$r_y(0) = \frac{b_0^2\lambda^2}{1-a_0^2} + \frac{1+c_0^2-2a_0c_0}{1-a_0^2}\,\sigma^2$$

- p. 341, solution 8.2. The state equation should read:

$$\mathbf{x}_{t+1} = \begin{bmatrix} -1 & -2 & 1 & 0 \\ -3 & -4 & 0 & 1 \\ -5 & -6 & 0 & 0 \\ -7 & -8 & 0 & 0 \end{bmatrix} \mathbf{x}_t + \begin{bmatrix} 8 & 8 \\ 8 & 8 \\ 8 & 8 \\ 8 & 8 \end{bmatrix} \mathbf{e}_t$$

  It is worth noting that the example is poorly chosen as the AR-polynomial is unstable.