Errata for "Bayesian and Frequentist Regression Methods"

- **Chapter 2:** Page 35, line 12, should be "$\boldsymbol{A}_n = \boldsymbol{A}$ and $\boldsymbol{B}_n = \boldsymbol{B}/n$".
- **Chapter 2:** Page 40, last line, should be:

$$\sqrt{n}(\widehat{p} - p) \to_d \mathrm{N}\left[0, p(1-p)\right],$$

- **Chapter 2:** Page 43. The information should be:

$$I(\theta) = \frac{n \exp(\theta)}{[1+\exp(\theta)]^2}$$

and so the asymptotic distribution is

$$\sqrt{n}(\widehat{\theta} - \theta) \to_d \mathrm{N}\left(\theta, \frac{[1+\exp(\theta)]^2}{\exp(\theta)}\right).$$

- **Chapter 2:** Page 50, lines 7, $\boldsymbol{D}$ is the $n \times (k+1)$ matrix of derivatives with elements $\partial\mu_i/\partial\beta_j$, $i = 1, \dots, n, j = 1, \dots, k+1$.
- **Chapter 2:** Page 50, 3 lines below equation (2.30), "assuming $\mathrm{var}(Y \mid \boldsymbol{\beta}) = \alpha\boldsymbol{V}$."
- **Chapter 2:** Page 54, line 14 should read, "The form of the mean-variance relationship given by (2.36) and (2.37) suggests".
- **Chapter 2:** Page 57, line 6,

$$\boldsymbol{A} = \mathrm{E}\left[\frac{\partial}{\partial\boldsymbol{\theta}^{\mathrm{T}}}\boldsymbol{G}(\boldsymbol{\theta}, Y)\right].,$$

- **Chapter 2:** Page 57, line 13,

$$\widehat{\boldsymbol{A}}_n = \frac{1}{n}\sum_{i=1}^{n} \frac{\partial}{\partial\boldsymbol{\theta}^{\mathrm{T}}}\boldsymbol{G}(\widehat{\boldsymbol{\theta}}, Y_i),$$

- **Chapter 2:** Page 59, in the Model-based variance line of Table 2.2, the Likelihood entry should be

$$-\left\{\sum_i \mathrm{E}\left[\frac{\partial^2}{\partial\beta^2}\log L_i\right]\right\}^{-1}$$

- **Chapter 2:** Page 59. Footnote of table should end with a period.
- **Chapter 2:** Page 65, line 13, "is not close to F".
- **Chapter 2:** Page 68, line 16,

$$\widehat{\theta}_n^{\star} \approx \widehat{\theta}_n - \frac{\boldsymbol{S}(\widehat{\theta}_n)^{\mathrm{T}}\boldsymbol{D}\mathbf{1}_n}{n\widehat{A}_n}$$

- **Chapter 2:** Page 68, line 18,

$$\mathrm{E}\left[\widehat{\theta}_n^{\star} - \widehat{\theta}_n\right] \approx -\frac{\boldsymbol{S}(\widehat{\theta}_n)^{\mathrm{T}}\mathrm{E}[\boldsymbol{D}]\mathbf{1}_n}{n\widehat{A}_n} = -\frac{\boldsymbol{S}(\widehat{\boldsymbol{\theta}}_n)^{\mathrm{T}}\mathbf{1}_n}{n\widehat{A}_n} = \mathbf{0}$$

- **Chapter 2:** Page 75, line 4, "Since $(p-r)$ elements of the score vector are zero, that is, $\boldsymbol{S}_{n1}(\widehat{\boldsymbol{\theta}}_n^0) = \mathbf{0}$, we have

$$\boldsymbol{S}_{n2}(\widehat{\boldsymbol{\theta}}_n^0)^{\mathrm{T}}\boldsymbol{I}_{22.1}^{-1}(\widehat{\boldsymbol{\theta}}_n^0)\boldsymbol{S}_{n2}(\widehat{\boldsymbol{\theta}}_n^0)/n \to_d \chi_r^2.$$

- **Chapter 2:** Page 75, line -6

$$\sqrt{n}(\widehat{\boldsymbol{\theta}}_{n2} - \boldsymbol{\theta}_{20})^{\mathrm{T}} \boldsymbol{I}_{22.1}(\widehat{\boldsymbol{\theta}}_n^0)\sqrt{n}(\widehat{\boldsymbol{\theta}}_{n2} - \boldsymbol{\theta}_{20}) \to_d \chi_r^2$$

- **Chapter 3:** Page 92. Line 4, there is a $d\theta$ missing.
- **Chapter 3:** Page 106. The second line of the third displayed equation should read

$$\approx \exp\left[nh(\widetilde{\theta})\right] \int_{-\infty}^{\infty} \exp\left[\frac{nh^{(2)}(\widetilde{\boldsymbol{\theta}})}{2}(\theta - \widetilde{\theta})^2\right] d\theta,$$

- **Chapter 4:** Page 193. In Exercise 4.4 the conditional distributions should be as below.

$$\begin{aligned}
\delta \quad &| \quad \tau^2, \pi_0, \boldsymbol{H}, \boldsymbol{y} \\
\tau^2 \quad &| \quad \delta, \pi_0, \boldsymbol{H}, \boldsymbol{y} \\
\pi_0 \quad &| \quad \tau^2, \delta, \boldsymbol{H}, \boldsymbol{y} \\
H_i \quad &| \quad \delta, \tau^2, \pi_0, \boldsymbol{y}, \qquad i = 1, ..., m,
\end{aligned}$$

- **Chapter 5:** Page 228. Table 5.8 should be as below.

Source	Sum of Squares	DF	MS	EMS
Factor A	$\mathrm{SS_A} = b\sum_{i=1}^a(\overline{Y}_{i.} - \overline{Y}_{..})^2$	$a-1$	$\frac{\mathrm{SS_A}}{a-1}$	$\sigma^2 + \frac{b\sum_{i=1}^a \alpha_i^2}{a-1}$
Factor B	$\mathrm{SS_B} = a\sum_{j=1}^b(\overline{Y}_{.j} - \overline{Y}_{..})^2$	$b-1$	$\frac{\mathrm{SS_B}}{b-1}$	$\sigma^2 + \frac{a\sum_{j=1}^b \beta_j^2}{b-1}$
Error	$\mathrm{SS_E} =$ $\sum_{i=1}^a\sum_{j=1}^b(Y_{ij} - \overline{Y}_{i.} - \overline{Y}_{.j} + \overline{Y}_{..})^2$	$(a-1)(b-1)$	$\frac{\mathrm{SS_E}}{(a-1)(b-1)}$	σ^2
Total	$\mathrm{SS_T} = \sum_{i=1}^a\sum_{j=1}^b(Y_{ij} - \overline{Y}_{..})^2$	$ab-1$		

Table 5.8: ANOVA table for the two-way crossed classification with one observation per cell; DF is shorthand for degrees of freedom, MS for mean square and EMS for the expected mean square. The F statistics are given by: $[\mathrm{SS_A}/(a-1)]/[\mathrm{SS_E}/(a-1)(b-1)]$ for factor A and $[\mathrm{SS_B}/(b-1)]/[\mathrm{SS_E}/(a-1)(b-1)]$ for factor B.

- **Chapter 5:** Page 230. Table 5.10 should be:

Source	Sum of Squares	DF	MS	EMS
Factor A	$\mathrm{SS_A} = bn\sum_{i=1}^a(\overline{Y}_{i..} - \overline{Y}_{...})^2$	$a-1$	$\frac{\mathrm{SS_A}}{a-1}$	$\sigma^2 + \frac{bn\sum_{i=1}^a \alpha_i^2}{a-1}$
Factor B (within A)	$\mathrm{SS_B} = n\sum_{i=1}^a\sum_{j=1}^b(\overline{Y}_{ij.} - \overline{Y}_{i..})^2$	$a(b-1)$	$\frac{\mathrm{SS_B}}{a(b-1)}$	$\sigma^2 + \frac{a\sum_{j=1}^b \beta_j^2}{a(b-1)}$
Error	$\mathrm{SS_E} = \sum_{i=1}^a\sum_{j=1}^b\sum_{i=1}^n(Y_{ijk} - \overline{Y}_{ij.})^2$	$ab(n-1)$	$\frac{\mathrm{SS_E}}{ab(n-1)}$	σ^2
Total	$\mathrm{SS_T} = \sum_{i=1}^a\sum_{j=1}^b\sum_{i=1}^n(Y_{ijk} - \overline{Y}_{...})^2$	$abn-1$		

Table 5.10: ANOVA table for the two-way nested classification; DF is shorthand for degrees of freedom, MS for mean square and EMS for the expected mean square. The F statistics are given by: $[\mathrm{SS_A}/(a-1)]/[\mathrm{SS_E}/ab(n-1)]$ for factor A and $[\mathrm{SS_B}/a(b-1)]/[\mathrm{SS_E}/ab(n-1)]$ for factor B

- **Chapter 7:** Page 315, lines 12 and 13:

$$\begin{aligned}
\mathrm{E}[q_i] &= p_i = \frac{a_i}{d} \\
\mathrm{var}(q_i) &= \frac{p_i(1-p_i)}{d+1}
\end{aligned}$$

The first line contains a clarification, the second contains a corrected typo.

- **Chapter 8:** Page 373, line 6. In the expression for the MSE, replace $\overline{y}_{ij}$ by y_{ij}.
- **Chapter 8:** Page 382. line 4. "so that (8.28) is recovered".
- **Chapter 8:** Page 384, line 22. "Student's t" to "Student's t".
- **Chapter 8:** Page 384, line 27. "scale r/s" to "scale $1/rs$".
- **Chapter 9:** Page 489, line 9. Equation should be

$$= \exp\left(\beta_1 + \sqrt{D_{11}}/2\right) + \exp\left(\beta_2 + \sqrt{D_{22}}/2\right)$$

- **Appendix A:** Page 650, line 19, and equation below, should read, "If $\boldsymbol{A}$ is again a $p \times p$ matrix then"

$$\frac{\partial}{\partial \boldsymbol{x}}(\boldsymbol{u}^{\mathrm{T}}\boldsymbol{A}\boldsymbol{u}) = \frac{\partial \boldsymbol{u}^{\mathrm{T}}}{\partial \boldsymbol{x}}\boldsymbol{A}\boldsymbol{u} + \frac{\partial \boldsymbol{u}^{\mathrm{T}}}{\partial \boldsymbol{x}}\boldsymbol{A}^{\mathrm{T}}\boldsymbol{u}.$$

- **Appendix G:** Page 670, line -5:

$$\widehat{\phi}(T) = \mathrm{E}[\widetilde{\phi}(\boldsymbol{Y}) \mid T].$$

- **Appendix G:** Page 673. In equation (G.3), Y_m should be replaced by Y_n.