

Errata for *Computational Statistics*, 1st Printing

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Here is a list of corrections and other notes. We appreciate comments from our careful readers, including Jim Albert (JA), Jim Brennan (JB), Shoja'eddin Chenouri (SC), Hugh Chipman (HC), Stephanie Fitchett (SF), Doug Gorman (DG), Andrew Hill, Michael Höhle (MH) and Duncan Murdoch (DM). Corrections and an improved discussion of Gibbs sampling are offered in later printings now available from Wiley.

Website:

- Dataset alzheimers.dat: as of 11/21/05 this is no longer missing. (MH)
- Dataset baseball.dat (9/29/05) and mars.dat (11/29/05): the final few lines were mysteriously truncated. The datasets and the overall zipfile were updated on the dates indicated. (HC and DG)

Chapter 1:

- Page 8, the multivariate normal density needs a minus sign inside the curly braces.
- Page 11, two lines below equation (1.30), clearly $c = 1 / \int f(\boldsymbol{\theta})L(\boldsymbol{\theta}|\mathbf{x}) d\boldsymbol{\theta}$.

Chapter 2:

- Page 20, middle portion of third paragraph should read "...will be nonlinear. Solving linear equations is easy, however there is another class of difficult optimization problems where the objective function itself is linear and there are linear inequality constraints. Such problems can be solved..." (DM)

Chapter 3:

- Page 61, second line from bottom should read "converge to a local maximum". (DM)
- Page 64, first line of third paragraph should read "over the entire". (DM)
- Page 76, Figure 3.6: graphical convention would normally have the vertical arrow pointing up, in the direction of increasing fitness.

Chapter 4:

- Page 94, third line below table should read "observed phenotype counts". (JB)

Chapter 5:

- Page 126, the first two sentences of Section 5.1.2 are unintentionally repeated. (DM)

Chapter 6:

- Page 155, the final sentences of Section 6.2.3.2 should read “Adaptive rejection sampling can also be extended to densities that are not log-concave, for example by applying Markov chain Monte Carlo methods like those in Chapter 7. One strategy is given in [210].” (DM)
- Page 157, line below (6.17) has “Lebesgue’s” misspelled. (DM)
- Page 171, the sentence on lines 5–6 should read “Hence, $h_2(1 - \mathbf{U}_{i1}, \dots, 1 - \mathbf{U}_{im}) = h_1(F_1^{-1}(1 - U_{i1}), \dots, F_m^{-1}(1 - U_{im}))$ is monotone in each argument and has the...”.
- Page 171, seventh line of Example 6.6 should read “ $\widehat{\text{cor}}\{h(X_i), h(-X_i)\}$ ”. (SC)
- Page 178, problem 6.3. There is a portion missing here. Part (a $\frac{1}{2}$) is: Repeat the estimation using rejection sampling. Then the last line of part (b) should read “. . .to the output obtained in part (a $\frac{1}{2}$)” and part (c) should ask you to compare (a $\frac{1}{2}$) to (b).
- Page 179, exercise 6.4 has awkward year indexing. Let i equal (year – 1851 + 1). In part (a) and following, let the prior for θ be discrete uniform on $\{1, 2, \dots, 111\}$. (JA)

Chapter 7:

- Page 183, line 2 is incomplete. Methods for obtaining both approximate and exact samples were discussed. (DM)
- Page 195, the last line of Section 7.2 should read “. . .from univariate conditional distributions, which are...”.
- Page 195-8. Section 7.2.1 is seriously flawed due to our overenthusiastic attempt to simplify the initial motivation and exposition of Gibbs sampling. For each i in the chosen ordering, the update *must* be carried out using the most recent values of \mathbf{X}_{-i} , as we correctly describe in Section 7.2.2. Thus, the correct algorithm is:
 1. Select starting values $\mathbf{x}^{(0)}$, and set $t = 0$.
 2. Generate, in turn,

$$\begin{aligned} X_1^{(t+1)} | \cdot &\sim f(x_1 | x_2^{(t)}, \dots, x_p^{(t)}), \\ X_2^{(t+1)} | \cdot &\sim f(x_2 | x_1^{(t+1)}, x_3^{(t)}, \dots, x_p^{(t)}), \\ &\vdots \\ X_{p-1}^{(t+1)} | \cdot &\sim f(x_{p-1} | x_1^{(t+1)}, x_2^{(t+1)}, \dots, x_{p-2}^{(t+1)}, x_p^{(t)}), \\ X_p^{(t+1)} | \cdot &\sim f(x_p | x_1^{(t+1)}, x_2^{(t+1)}, \dots, x_{p-1}^{(t+1)}), \end{aligned} \tag{1}$$

where $|\cdot$ denotes conditioning on the most recent updates to all other elements of \mathbf{X} .

3. Increment t and go to step 2.

The incorrect updating approach is also shown in the Example 7.4 equations at the bottom of page 197; changing updated variables to have $(t + 1)$ superscripts fixes this.

To understand the error, consider a target distribution for (X, Y) that is uniform on the triangle given by $X > 0$, $Y > 0$, and $X + Y < 1$. Then if $(X^{(t)}, Y^{(t)})$ is near $(0, 0)$, the composition of two single-coordinate updates each conditional on the previous value of the other coordinate generates a move that would fall outside the triangle about 50% of the time. The chain therefore does not have the correct stationary distribution. (DM)

- Page 207, fourth line under equation (7.21) should cite [202] not [365].
- Page 215, exercise 7.6 has awkward year indexing. Let i equal $(\text{year} - 1851 + 1)$. Let the prior for θ be discrete uniform on $\{1, 2, \dots, 111\}$. Also, there is a typo in the first line, which should read “1851 to 1962”. (JA)

Chapter 8:

- Page 224, paragraph 2, line 5 “parameters” is misspelled.
- Page 225, the final sentence of the top paragraph (lines 4–5) should be deleted; it is not true. (DM)
- Page 232, step 2, line 2 should read “. . .and run each chain. . .”, and line 4 should read $X_k^{(0)} = q(X_k^{(-1)}, \mathbf{U}^{(0)})$. (DG)
- page 232, step 3, third line from end replace “much” with “must”.

Chapter 9:

- Page 263, last line of Example 9.7, the interval is $(-0.197, -0.169)$.
- Page 266-7, seventh paragraph of Section 9.3.2.4, middle sentences should read: “Let $F_1(q, F) = P[\widehat{R}_1(\mathcal{X}, F) \leq q]$. Then the correct size test rejects the null hypothesis if $\widehat{R}_1 > F_1^{-1}(1 - \alpha, F)$.” Figure 9.3 should also have the R_1 's replaced by \widehat{R}_1 's.

Chapter 10:

- Page 289, last sentence of the first full paragraph: delete the portion after the comma, so the sentence ends with “. . . anticipate $h_0 > h$.”

Chapter 11:

- Page 336-7, Figure 11.13: The line types don't match the text or the previous figure. We'll fix the figure in the third printing, but for now, the caption and the third line on page 337 should indicate $j = 1$, $h_1 = 0.05n$ (solid); $j = 2$, $h_2 = 0.2n$ (dotted); and $j = 3$, $h_3 = 0.5n$ (dashed).
- Page 337, fourth line from the bottom should read “ $\mathbf{Y}^* = \widehat{\mathbf{Y}} + \mathbf{e}^*$ ”.
- Page 339, paragraph below Example 11.9: Alternatively, the pointwise median bootstrap curve could be used to center the interval (instead of $\hat{s}(x)$). For hypothesis testing, the pointwise median null band should be used.

- Page 340, the second sentence below (11.38) should read “Eliminate those bootstrap fits whose V^* values are in the upper tail of this empirical distribution.” (DM)

Chapter 12:

- Page 366, item 3, two instances of “training-set” should be replaced by “validation-set”.