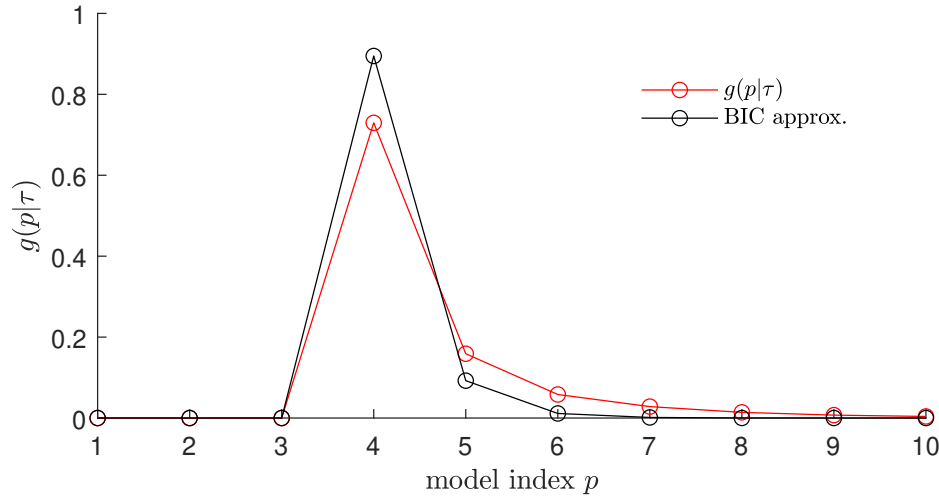


Data Science and Machine Learning: Mathematical and Statistical Methods

Errata

(Last Update 8th July 2021)

1. Page 37, line 3 from the top: replace $\mathbb{E}Y_i$ with $\mathbb{E}_{\mathbf{x}}Y_i$.
2. Page 38, lines 3,4 in second paragraph: replace $\ell_{\mathcal{T}_k}$ symbol with ℓ_{C_k} .
3. Page 38, first line in displayed equation: replace $\ell_{\mathcal{T}_k}$ symbol with $\ell_{C_k}(g_{\mathcal{T}_k})$.
4. Page 57, Figure 2.16. There was a mistake in the drawing of the BIC approximation. The actual BIC approximation matches the posterior density quite well:



5. Page 72, Line -2: ... in terms of the probability ... (remove repeated “the”).
6. Page 100, Line -8: $(1 - \alpha v)$ should be $(1 - \alpha)v$.
7. Page 162: Line 12: $\Sigma^{1/2}\mathbf{x}$ should be $\Sigma^{-1/2}\mathbf{x}$.
8. Page 162: Lines 17 and 20: $\Sigma^{1/2}(\mathbf{x}_i - \boldsymbol{\mu})$ should be $\Sigma^{-1/2}(\mathbf{x}_i - \boldsymbol{\mu})$.
9. Page 178: fourth line below Table 5.1: replace “qualitative” with “quantitative”.
10. Page 179, fourth line in Example 5.5: replace “row-wise” with “column-wise” and the vector \mathbf{y} with $\mathbf{y} = [9.2988, 8.2111, 9.0688, 8.2552, 9.4978, \dots, 8.9485]^\top$.
11. Page 181, formula for R_{adjusted}^2 at the bottom: replace $n - p - 1$ in the formula with $n - p$.
12. Page 184, formula for F_i should have the norms squared:

$$F_i = \frac{\|\mathbf{Y}^{(i)} - \mathbf{Y}^{(i-1)}\|^2 / p_i}{\|\mathbf{Y} - \mathbf{Y}^{(d)}\|^2 / (n - p)} .$$

13. Page 211, Exercise 12 (b): \mathbf{P}_{ii} should be $(1 - \mathbf{P}_{ii})$; that is 1 minus the i -th leverage.
14. Page 221, Line 8: ... one obtains the so-called ...
15. Page 219, Line -2: ... only β_1 is regularized.
16. Page 247, Algorithm 6.8.1, Line 1: \mathbb{R}^p should be \mathbb{R}^n .
17. Page 248, Algorithm 6.8.2, Line 1: Set $\mathbf{B} \leftarrow (n\gamma\mathbf{I}_p)^{-1}$.
18. Page 235, Line 7: $\int_0^1 (g''(x))^2 dx$ instead of $\int_0^1 (g'')^2 dx$.
19. Page 273, 3rd line under Figure 7.9: The results are summarized in Table 7.6.
20. Page 329, line 12 from below: change y_{i-k} to y_{i-k+1} .
21. Page 331, last displayed equation:

$$\frac{\partial C}{\partial \mathbf{b}_l} = \frac{\partial \mathbf{z}_l}{\partial \mathbf{b}_l} \frac{\partial C}{\partial \mathbf{z}_l} = \delta_l, \quad l = 1, \dots, L.$$

22. Page 335, Algorithm 9.4.2, Line 2: ... using $\frac{\partial C}{\partial \mathbf{g}} = 1$...
 23. Page 340, second displayed line:
- $$[p_0, p_1, p_2, p_3] = [1, 20, 20, 1].$$
24. Page 341, Line 3: Remove the line $\mathbf{S} = \text{RELU}$.
 25. Page 351, Exercise 7(b): In the displayed formula, \mathbf{B} should be replaced with \mathbf{B}^{-1} .
 26. Page 362, First sentence in paragraph above Theorem A.4: ... the matrix \mathbf{P} projects any vector in \mathcal{V} onto itself.
 27. Page 362, Sentence above Theorem A.4: ... where \mathbf{U} is not ...
 28. Page 380, third line from below: change b_{i-k} to b_{i-k+1} .
 29. Page 394, line 5: ... can be computed with the aid ... (missing “the”)
 30. Page 404, last two lines: replace H with \mathbf{H} .
 31. Page 414, Section B.3.4: Replace ℓ with ℓ_τ .
 32. Page 433, displayed equation in the proof of Theorem C.4: replace $|\mathbf{J}_{\mathbf{g}^{-1}}(\mathbf{z})|$ with $|\det(\mathbf{J}_{\mathbf{g}^{-1}}(\mathbf{z}))|$.
 33. Page 439, line 4: is equal to $\Gamma(\alpha)\lambda^{-\alpha}$ times ...
 34. Page 442, 4th line from the bottom: $x \geq c$ should be $x > c$.
 35. Page 445, halfway on the page: $|e^{ix} - 1| = \left| \int_0^x i e^{i\theta} d\theta \right| \leq \left| \int_0^x |i e^{i\theta}| d\theta \right| = |x|$.

- 36. Page 446, displayed equation below (C.37): $O(t/n)$ should be $o(t/n)$, and in the next displayed equation, $o(1)$ should be $o(1/n)$.
- 37. Page 448, line 2: $O(t^3/n^{3/2})$ should be $o(t^2/n)$.
- 38. Page 450, first displayed equation after (C.39): The Σ in the denominator should be Σ_n .
- 39. Page 456, Sentence under (C.47): Similar to the one-dimensional case ($d = 1$), replacing the factor $1/n$ with $1/(n - 1)$ gives an unbiased estimator, called the *sample covariance matrix*.
- 40. Page 511, line 13 from above: ‘expectation of’.