

CORRECTIONS for ‘Mathematical foundations of infinite-dimensional statistical models’, Cambridge University Press 2016, by E. Giné and R. Nickl

Below is a list of typos and corrections for the hardback version [compiled 16/12/2020].

p.6, line -9, replace ‘would assume’ by ‘assumed’

p.11, midpage display, ‘ $\langle f, \phi_{in} \rangle$ ’ should be ‘ $\langle f, \phi_{in} \rangle_n$ ’.

p.15, line 4 of Sec.2.1, delete repetition of ‘a’.

p.17, l.15, ‘metric space’ should be ‘normed space’

p.17, three lines before Prop. 2.1.4, reference should be to ‘Exercise 2.1.6’ instead of ‘Exercise 2.6’.

p.21, in the proof of Theorem 2.1.13, ‘inequalities’ should be ‘equalities’.

p.24, in equation (2.3) and the line after it, replace (twice) ‘ $1/\pi^2$ ’ by ‘ $4/\pi^2$ ’, and in line -1, replace once more ‘ $K = \frac{1}{\pi^2}$ ’ by ‘ $K = \frac{4}{\pi^2}$ ’.

p.25, in l.6, replace ‘ $T_0 = \{t_i\}_{i=1}^n$ ’ by ‘ $T_0 = \{t_i\}_{i=1}^\infty$ ’. Then, in the second display in the proof of Theorem 2.1.20, ‘ $-u^2/2\pi^2$ ’ has to be replaced by ‘ $-2u^2/\pi^2$ ’ and three lines below, ‘ $-u_0^2/2\pi^2$ ’ should be replaced by ‘ $-2u_0^2/\pi^2$ ’.

p.30, midpage, ‘measure’ should be ‘measure’.

p.31, bottom, three occurrences of ‘ π_m^{-1} ’ should be replaced by ‘ $\tilde{\pi}_m^{-1}$ ’

p.33, midpage, ‘ $X :$ ’ should be ‘ $\tilde{X} :$ ’.

p.36, in Ex.2.2.11, before ‘(a)’, add phrase: ‘Show that:’; then in eq. (2.21), replace ‘ t^2 ’ by ‘ u^2 ’.

p.37, equation (2.24): replace ‘ $Ee^{\xi^2/c^2} = \dots$ ’ by ‘ $Ee^{\xi^2/c^2} - 1 = \dots$ ’.

p.39, delete last phrase ‘with constants...’ from the proof of Lemma 2.3.3.

p.40, in l.8, in the definition of λ , ‘ σ_i^2 ’ should be replaced by ‘ σ_i ’. Then in the second inequality in the display following (2.36), ‘ C ’ should be replaced by ‘ $2C$ ’.

p.44, In Theorem 2.3.8, ‘sub-Gaussian’ should be replaced by just ‘Gaussian’. Then in the proof add a phrase to read: ‘The proof of (2.44) (which in fact applies also to sub-Gaussian processes) consists of...’

p.47, in Ex.2.3.4, replace ‘for ρ on V ’ by ‘for $\sqrt{6}\rho$ on V ’. Then, in Ex.2.3.8, the expression in the last display should read ‘

$$\left\| \sup_k \frac{|\xi_k|}{\psi_2^{-1}(k)} \right\|_{\psi_2} \leq \dots'$$

p.48, line 1, replace ‘Show, using Chebyshev’s inequality, that’, by ‘Assume $\|\xi_k\|_{\psi_2} \leq 1$. Then using a union bound,’

p.52, last but one display in the proof of Corollary 2.4.6, change ‘ \leq ’ to ‘ \geq ’. Then in the last display, on the left hand side, add a factor of ‘ $g^2(t)$ ’ to read ‘ $g^2(t)(f/g)'(t) = \dots$ ’. Finally, in line -3 on p.52, add a comma before x_n .

p.53, line after (2.55), replace second ‘ $|\lambda_i|$ ’ by ‘ $|\mu_i|$ ’.

p.57, line -8 to -2: it should read i) ‘ $d(t_i, t_j) \geq \varepsilon$ ’ (missing comma), then ii) ‘ $= \varepsilon^2/2 \leq d_X^2(t_i, t_j)$ ’ (divide by two) and iii) the maxima in the display should be over ‘ $s \in S$ ’ instead of ‘ $t \in S$ ’. In Corollary 2.4.13, ‘ $\liminf_{\varepsilon \downarrow 0}$ ’ should be replaced by ‘ $\limsup_{\varepsilon \downarrow 0}$ ’.

p.58, line 4, delete ‘part (b) of’.

p.59, Ex.2.4.1, replace ‘ $I_{\lambda I_A + (1-\lambda)I_B}$ ’ by ‘ $I_{\lambda A + (1-\lambda)B}$ ’. In Ex. 2.4.3, ‘point’ should be ‘points’. Then in Ex.2.4.6, ‘ \geq ’ should be ‘ \leq ’.

p.65, In Exercise 2.5.1, the first display should read

$$\int_{(-L_n, L_n)^c} \left(\frac{1}{2} (f^2 + 1)^{1-\varepsilon_n} (\log(f^2 + 1))^2 + 2\varepsilon_n^{-\varepsilon_n} (f')^2 \right) d\gamma < \varepsilon_n,$$

and in the lines below add ‘twice’ twice as indicated. Finally, in Ex.2.5.2, replace ‘Theorem 2.5.8’ by ‘Theorem 2.5.7’.

p.66, last line of Exercise 2.5.2: delete ‘ $\leq \|F\|_{Lip}$ ’ and write ‘such that $\|F_\varepsilon\|_{Lip} \leq \|F\|_{Lip}$ ’.

p.68, line 1, add ‘with integral x ’ to read ‘A random variable X is *Pettis or weakly integrable* with integral x if $f(X)\dots$ ’.

p.68, 1.2 after Lemma 2.6.3 should read ‘if $f(X)$ is a mean zero normal random variable...’ Then in the next paragraph, replace ‘It should be mentioned that.. ’ by ‘Recall that..’

p.70, last display, second equality should be inequality

p.72, last display in the proof of Theorem 2.6.10, ‘ $m \leq \mathbb{N}$ ’ should read ‘ $m \in \mathbb{N}$ ’.

p.74, second display, replace ‘ $-\|h\|_H^2$ ’ by ‘ $-\|h\|_H^2/2$ ’, and on line -6, $f(v_i)$ should be $f_i(x)$.

p.76, In the first display in the proof of Proposition, the last occurrence of ‘ $/\sigma^2$ ’ should be replaced by ‘ $/2\sigma_i^2$ ’, and the same correction applies to the r.h.s.’s of a) in the line below and in the subsequent display.

p.77, first display, replace ‘ σ^2 ’ by ‘ σ_i^2 ’.

p.79, lines -5,-4 of the proof of Lemma 2.6.21, ‘ h_{ve} ’ should be ‘ h_ε ’ and ‘ $m_0(\omega), \infty$ ’ should read ‘ $m_0(\omega) < \infty$ ’.

p.89, after (2.90), it should read ‘ $\phi(x)$ ’.

p.118, in Theorem 3.1.7, replace ‘ $1/n$ ’ by ‘ $(1/n)$ ’.

p.119, proof of Prop. 3.1.8, replace the index ‘ k ’ five times by ‘ i ’, to read ‘ $1 \leq i \leq n$, X_i and σ_i ’,

p.128, line 6, replace ‘ \dots, a_{i_n} ’ by ‘ \dots, a_{i_k} ’.

p.130, in equation (3.48), replace ‘ $\|Y_n^*\|_T$ ’ by ‘ $\|Y_n^*\|_p$ ’.

p.157f., line 1, ‘ v ’ should be ‘ v_n ’. The text in the following lines should be changed as follows: ‘Then, assuming also $U = 1$ we have [display (3.98)], and also, for all $x \geq 0$, [display (3.99).] Moreover, for any $U > 0$, [display 3.100],...’

p.158, in Theorem 3.3.10, change to read ‘...as in Theorem 3.3.9 and with $U = 1$, we have’. Then 12 occurrences of U and one of U^2 in the following displays can all be deleted. The same applies on p.159, where three more occurrences of U can be deleted.

p.188, in the last display of the proof of Theorem 3.5.4, replace ‘ $\|U\|_{L^2(P)}$ ’ by ‘ $(\|U\|_{L^2(P)}/\|F\|_{L^2(P)})$ ’.

p.189, midpage: delete sentence involving Exercise 3.6.17

p.190, in equation (3.184), ‘ $\|F\|_{L^2(Q)}$ ’ should be replaced by ‘ $\|F\|_{L^2(P)}$ ’ twice.

p.193, last display, the first quantity should read $Q[(f^2 - g^2)^2]$ instead of just $Q(f^2 - g^2)$.

p.195, midpage, replace ‘ $L^p(\mathbb{R})$ ’ by ‘ $L^p(P)$ ’.

p.202, line 1 of Prop. 3.5.15, ‘ $\leq \delta$ ’ should be ‘ $\leq \delta^2$ ’.

p.213, line -4, replace the sentence by ‘Thus all the sets $V \in T_x(\mathcal{V})$ satisfy that if $x \in V$ then $V \setminus \{x\} \in T_x(\mathcal{V})$.’ In the display just before, ‘ $T_x(V) = V$ ’ should be replaced by just ‘ V ’.

p.214, midpage, the reference is to W. Feller, An Introduction to Probability Theory and Its Applications, Vol. 1, 1968, p.52, which should be added to the bibliography in the back.

p.226, The hint to Exercise 3.6.5 can be deleted and replaced by: ‘See Proposition 4.3.34.’

p.227, line 2 (in Exercise 3.6.7), add phrase to read ‘...taking values on $[0, 1]$ and of variation bounded by one. [See also Corollary 3.7.50.]’

p.241, before Corollary 3.7.21, after ‘Bochner sense’, add ‘(see before Lemma 2.6.3)’.

p.245, in display (3.253), all six occurrences of ‘ f ’ should be replaced by ‘ H ’.

p.273, delete ‘, Proposition 3.1.23 (see also Exercises 3.1.5 and 3.1.6)’ to read ‘..of P -Donsker class and Theorem 3.7.31.’ Then add ‘By part c) of that theorem the class $\tilde{\mathcal{F}} = (rf(x) : f \in \mathcal{F})$ defined on the sample space $\{-1, 1\} \times S$ is Q -Donsker for the law $Q = R \times P$, where R is the Rademacher law. Then $\tilde{\mathcal{F}}$ is Q -centred, and so the expression in (3.281) converges to zero by Theorem 3.7.31b.’

p.280, line -6, ‘Exercise 3.7.17’ should be ‘Exercise 3.6.17’.

p.283, in line 2 of Exercise 3.7.14, correct to read ‘ $N(f, x_1, \dots, x_r, \varepsilon) = \{g \in L^2 : |f(x_i) - g(x_i)| \leq \varepsilon, 1 \leq i \leq r\}$.’

p.296, eq.(4.15), delete overline.

p.315, in the second display of Proposition 4.2.8, the first occurrence of ‘ $2^{l(1/2-1/p)}$ ’ should be replaced by ‘ $2^{l/2}$ ’.

p.317, in the line after (4.53) as well as in line -3 on that page, ‘ $[2\pi/3, 4\pi/3]$ ’ should be replaced by ‘ $[2\pi/3, 8\pi/3]$ ’.

p.334, in the second display and the line after, ‘ c'_i ’ should be replaced by ‘ c'_j ’.

p.338, line -4, delete ‘that’.

p.356, last but one line in the large display, ‘ dv ’ should be ‘ dz ’.

p.357, eq. (4.129), the occurrence of π should be deleted to read ‘ $|k| \in [2^l/3, 2^l(4/3)]$ ’.

p.359, delete double ‘for’ in line 6

p.363, line -2, it should be ‘ ϕ_k^{left} ’ instead of ‘ ϕ_k^{left} ’,

p.364, in the display after eq. (4.142) and in (4.145), ‘ $2^J - 1$ ’ and ‘ 2^{l-1} ’ should be ‘ $2^J - 1$ ’ and ‘ $2^l - 1$ ’, respectively.

p.368, in Prop. 4.3.33, (i), replace ‘ $\|D^m f\|_p$ ’ by ‘ $\|f\|_{H_p^m(\mathbb{R}^d)}$ ’, and in the line below, (ii), replace ‘ $\|f^{(m)}\|_\infty$ ’ by ‘ $\|f\|_{C^m(\mathbb{R}^d)}$ ’.

p.370, 4 lines before (4.166), replace ‘ $O(2^{jd})$ ’ by ‘ $O(2^{ld})$ ’.

p.376, first display, replace ‘=’ twice by ‘ \lesssim ’.

p.377, eq. (4.184), ‘ ε_l ’ should be ‘ ε ’. Then in (4.185), ‘ M ’ can be replaced by ‘1’.

p.379, line 4, add comma after ‘large’.

p.380, first line after Theorem 4.4.3, reference to ‘Exercise 2.1.12’ should be to ‘Exercise 2.1.1’.

p.392, last line, the correct definition of D_{jm} is ‘ $D_{jm}(x) = 2^{-j/2}|\phi_{jm}(x)|$ ’.

p.395, first display, ‘ $\nu^{1/p}$ ’ should be ‘ $\nu_p^{1/p}$ ’.

p.399, In Proposition 5.1.7, the suprema over f in eq.s (5.19), (5.20) should be deleted. Then ‘if $f \in B_{p\infty}^s(A)$ ’, should be replaced by ‘if $\|f\|_{B_{p\infty}^s(A)} \leq B$ ’ and correspondingly ‘if $f \in B_{\infty\infty}^s(A)$ ’ should be replaced by ‘if $\|f\|_{B_{\infty\infty}^s(A)} \leq B$ ’.

p.406, in equation (5.31), ‘ c_p^2 ’ should be ‘ C_p^2 ’.

p.407, ‘ $EH^2(X)$ ’ should be replaced by ‘ $EH^2(X)$ ’.

p.433, in the last display and in l.2 of Theorem 5.2.11, \tilde{H} and \hat{H} should be replaced by just H

p.436, every occurrence of ‘ \rightarrow^d ’ should be replaced by ‘ $\rightarrow^{\mathcal{L}}$ ’

p.490, first display, this should read ‘ $(1/n)^{r/(2r+1/2)}$ ’.

p.p.492, the exponents in Theorem 6.2.11 should be ‘ $\frac{r}{2r+1}$ ’ and ‘ $\frac{r}{2r+1/2}$ ’.

p.507, Corollary 6.2.19, last display, it should be $1/n$.

p.514, in (6.104), replace ‘ $\frac{\sqrt{M}}{1+\sqrt{M}}$ ’ by ‘ $\frac{\sqrt{M}/3}{1+\sqrt{M}}$ ’.

p.520, mid-page, replace ‘By (6.14),’ by ‘By (6.16),’.

p.530, in display (6.130) replace ‘ $\sqrt{u_n}$ ’ by ‘ $u_n^{-\gamma}$ ’ and add ‘for some $\gamma > 0$.’ at the end of the sentence.

p.537, last display should read

$$= n^{-r/(2r+1-p^{-1})}, \text{ instead of } = n^{-r/(2r+1+p^{-1})},$$

p.545, line -2 in Theorem 7.1.4, replace ‘for some universal constant $0 < K < \infty$ and every $n \in \mathbb{N}$ ’ by ‘for all $n \in \mathbb{N}$ such that $n\varepsilon^2 \geq c_0$ and constant $K = K(c_0)$ ’.

p.559f., proof of Lemma 7.2.12: replace display in line -3 on that page by

$$\{\|\hat{p}_n - p_0\|_2 \lesssim n^{-t/(2t+1)}\} \cap \{\|\hat{p}_n - p_0\|_\infty \lesssim n^{-(t-1/2)/(2t+1)}\},$$

and on the next page, second line of the first display, replace ‘ $\|f\|_\infty \lesssim n^{-(t-1/2)/(2t+1)}$ ’ by ‘ $\|f\|_2 \lesssim n^{-t/(2t+1)}$ ’. In line 4 of p.560, reference to ‘Remark 3.5.5 (or (3.214))’ should be replaced by reference to ‘Corollary 3.5.7 with $F = u = \text{const}$, $\sigma \simeq n^{-t/(2t+1)}$ and $H(x) = x^{1/t}$ (or Remark 3.5.14)’.

p.561, in the first display, replace ‘ $\|f\|_\infty \lesssim n^{-(t-1/2)/(2t+1)}$ ’ by ‘ $\|f\|_2 \lesssim n^{-t/(2t+1)}$ ’.

p.562, after second display, delete the phrase ‘.in view of the converging to 0’, and replace it by ‘as in the proof of Lemma 7.2.12.’

p.562, last line of proof of Theorem 7.2.14, reference to ‘Proposition 4.4.5’ should be ‘Theorem 4.4.5’. A few lines below, ‘In view of (3.7.39)’ should be ‘In view of Corollary 3.7.39’.

p.571, it should read: ‘the maps $(x, f) \mapsto p_f(x)$ are jointly measurable’.

p.573, line -2, it should read ‘the mappings $(x, p) \mapsto p(x)$ are jointly measurable.’

p.576, in the proof of Theorem 7.3.3, the middle phrase should be changed to read: ‘with $\varepsilon_0 = m\varepsilon_n$ for $m < M$ large enough constants and $N(\varepsilon)\dots$ ’.

p.577, in eq.(7.95) ‘ $\leq \varepsilon_n^2$ ’ should be replaced by ‘ $\leq \varepsilon_n$ ’.

p.582, line -7, ‘Since the noise process..’ should read ‘If the noise process..’.

p.583, last line of Part a) of Condition 7.3.11: delete ‘ensuring $f \in L^2$ almost surely’.

p.588, line -4 of the proof of Proposition 7.3.13, the reference to ‘Lemma 2.3.2’ should be replaced by reference to ‘Lemma 2.3.4’.

p.591, line -4, should read ‘...likelihood (or, in fact, any efficient) estimator..’

p.595, in line 3 it should be $\delta > 1/2$ in place of $\delta > 0$, and likewise in Theorems 7.3.19 and 7.3.23 one has to require $\delta > 1/2$.

p.601, in eq.(7.136) and the second display of Theorem 7.3.23, ‘ $P_{f_0}^n, P_{f_0}$ ’ respectively, should be ‘ $P_{f_0}^Y$ ’.

p.602, last display of Corollary 7.3.24 should read

$$= O_P \left((n/\log n)^{-\gamma/(2\gamma+1)} u_n \right), \text{ instead of } O_P \left((n/\log n)^{\gamma/(2\gamma+1)} u_n \right)$$

p.609, in the 3rd display in Theorem 8.1.1, the exponents should be ‘ $\frac{1}{4r+1}$ ’ and ‘ $\frac{r}{4r+1}$ ’.

p.611, first display, ‘ $\frac{1}{|\mathcal{S}_n|}$ ’ should read ‘ $\frac{1}{|\mathcal{S}_n|^2}$ ’. Three lines below, replace ‘hence’ by ‘using’. Then in the last but one display on the page, the exponents should be ‘ $\frac{1}{4r+1}, \frac{-r}{2r+1/2}, \frac{r}{4r+1}$ ’, respectively.

p.612, 1st display in Theorem 8.1.3, exponent should be ‘ $\frac{r}{2r+1}$ ’.

p.617, first line of the proof of Lemma 8.2.1, it should read: ‘The case where $j_n^* = j_{\max}$ is obvious.’ [So ‘ \bar{j}_n ’ should be replaced by ‘ j_n^* ’.]

p.617, eq. (8.15), the r.h.s. of the inequality should read ‘ $P_f^Y \{ \sum_{\ell=j-}^{\ell-1} \sum_k (g_{\ell k}^1 - 1) > \dots \}$ ’; and as a consequence the sums in ℓ in the 2nd display on p.618 should be deleted.

p.618, in the (big) last display, every occurrence of ‘ \hat{j}_n ’ should be replaced by ‘ \bar{j}_n ’. In the last line of display (8.17), the last exponent should be written as ‘ $-2s/(2s+1)$ ’.

p.619, in the first display in Lemma 8.2.4, ‘ $\hat{\tau}$ ’ should be replaced by ‘ $\bar{\tau}$ ’.

p.621, in Theorem 8.2.5, it should read ‘for τ large enough depending only on an upper bound $S > s$, all $0 < s < S, B > 0$ and every...’

p.623 and p.626, at the beginning of the proof of Theorems 8.2.7, add sentence: ‘We prove the result for unspecified constants to simplify the exposition.’

p.626, second display from below, β_{lk} should be f_{lk} .

p.627, second display from below, the superindex $(s/2s+1)$ should be $\frac{s}{2s+1}$.

p.630, the sentence in line 5 after Theorem 8.3.1 should be completed to read as ‘...that only the minimax rate of the maximal model can be attained over the submodel $\Sigma(s)$.’

p.632, in the third display from below, ‘ $\Sigma(r, \tilde{\rho}_n)$ ’ should be replaced by ‘ $\tilde{\Sigma}(r, \rho_n)$ ’.

p.635, last line of proof of Theorem 8.3.5, replace reference to ‘Theorem 6.2.11, part (c)’, by ‘Theorem 6.2.20’.

p.638, line 2, should read ‘every $\alpha, \alpha' > 0$ ’.