Bickel–Doksum. Mathematical Statistics. Volume I.

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Errata

p. xiii, l. 5. "terrabytes" should be "terabytes".

p. xiv, l. -20. "Chapters 7–10" should be "Chapters 7–9".

p. 7, l. 13: Insert "a well defined parameter" after "we can define".

p. 9 In the statement of (2)**.** Change "there exists a set $\{x_1, x_2, \ldots\} \ldots$ all θ" to "the set $\{x_1, x_2, \ldots\} = \{x : p(x, \theta) > 0\}$ is the same set for all $\theta \in \Theta$".

p. 11, Ex. 1.1.5. Label the expression on line 9 as (1.1.4). On line 15, replace "model (a)" with "model (1.1.4)".

p. 14, l. -14. "Bayes rule" to "Bayes theorem".

p. 19, l. -7. Switch $\mathcal{N}(\mu + \Delta, \sigma^2)$ with $\mathcal{N}(\mu, \sigma^2)$.

p. 20, l. -16. After "of $\hat{\nu}$", insert "If $\text{Bias}(\hat{\nu}) = 0$, then $\hat{\nu}$ is called *unbiased*".

p. 20, l. 8 and l. 10. $\delta(\mathbf{x})$ should be $\delta(\mathbf{X})$.

p. 20, l. 9, Change "$l(P, \delta(X)$" to "$l(P, \delta(X))$".

p. 20, l. -12. "$[E(\hat{\nu}) - \mu]$" should be "$[E(\hat{\nu}) - \nu]$".

p. 21, l. -14. "$E(\hat{x} - \mu)^2$" should be "$E(\hat{X} - \mu)^2$".

p. 21, l. 7. "$n_0 = \sigma_0/\epsilon$" should be "$n_0 = (\sigma_0/\epsilon)^2$".

p. 23, l. 12. After "providing a small bound ... to minimize the probability of a Type II error," insert "The bound on the probability of a Type I error is called the *level of significance* and deciding Θ_1 is referred to as "Rejecting the hypothesis $H : \theta \in \Theta_0$ at level of significance α".

p. 25, l. -8. "$R(\theta_2\delta)$" should be "$R(\theta_2, \delta)$" .

p. 29, l. 16. "By (1.3.10)" should be "By (1.3.11)".

p. 34, l. -9. expansion of.

p. 35, $p(z, y)$ **table.** Should be "$p(1, 0) = 0.025$, $p(1, 1) = 0.025$".

p. 35, Bottom of page, Last equation. "$\sum_x$" should be "$\sum_z$".

p. 39, Thm. 1.4.4. "best MSPE" should be "best linear MSPE".

p. 39, l. -8. "$\mu_l(\mathbf{z})$" should be "$\mu_l(\mathbf{Z})$".

p. 44, l. 2. Change "P" to "P_θ".

p. 44, l. -13. "keeep" should be "keep".

p. 46, l. 3. "μ" should be "θ" in the equation.

p. 46, l. 8. "same risk as $\delta^*(\mathbf{X})$" should be "same risk as $\delta(\mathbf{X})$".

p. 47, l. -9. "The formula (1.5.8)" should be "The formula (1.2.8)".

p. 51, l. 9. natural sufficient statistics $T^{(m)}(x) = \sum_{i=1}^m T(x_i)$.

p. 52, middle of page. "we show in Section 1.6.2" should be "we show in Theorem 1.6.3".

p. 53, l. 8. moment generating property

p. 54, l. 1. "By Theorem 1.3.1" should be "By Theorem 1.5.1".

p. 54, l. 7. "$\mathbf{T}^{(m)}(x)$" should be "$\mathbf{T}^{(m)}(\mathbf{X})$".

p. 55, l.7. Should be : "$\underset{\sim}{T}(\underset{\sim}{Y}) = (\Sigma Y_i, \Sigma z_i Y_i, \Sigma Y_i^2)^T$" (interchange T_2 and T_3).

p. 55, l. 2. "$log(\pi/ - \eta_2)$" should be "$log(\pi/(-\eta_2))$".

p. 57, l. -10. "$\log(2\pi\lambda_0^2\theta^2)$" should be "$\log(2\pi\lambda_0^{-2}\theta^2)$".

p. 58, l. 8. "$\sum_{j=1}^n$" should be "$\sum_{j=1}^3$".

p. 59, l. -11. "$\underset{\sim}{\eta}_0, \underset{\sim}{\eta}_1 \in \varepsilon$" should be "$\underset{\sim}{\eta}_1, \underset{\sim}{\eta}_2 \in \varepsilon$".

p. 59, Thm. 1.6.3. c) nonempty interior $\mathcal{E}^0$ in R^k and $\boldsymbol{\eta}_0 \in \mathcal{E}^0$.

p. 60, l.60. Insert "n" in front of the second, third, and fourth expression.

p. 62, (1.6.16). "$\pi^{-p/2}$" should be "$(2\pi)^{-p/2}$".

p. 65, l. -12. "$(T_1(X), \ldots, T_k(X))$" should be "$(T_1(X), \ldots, T_k(X))^T$".

p. 66, formula for w in the middle of the page. Insert "t_{k+1}" after "$B(\underset{\sim}{\theta})$".

p. 70, l. 2. "if the events $T_1 \geq t, \ldots, T_k \geq t$" should be "if and only if the events $T_1 > t, \ldots, T_k > t$".

p. 70, l. 10. "scale parameter δ" should be "scale parameter δ^{-1}".

p. 70, l. 14. "T_0 and Y" should be "T and Y".

p. 78, l. 10. $E(X-\mu)^4 = 3\sigma^4$.

p. 78, Prob. 1.3.8. (ii) "Let $\hat{\sigma}_0^2 =$" should be "Let $\hat{\sigma}_c^2 =$".

p. 80, l. -8. "predictor Y" should be "predictor of Y".

p. 81, l. -16. "$Cor(Z, Y)$" should be "$Corr(Z, Y)$".

p. 83, l. 13. "(2000)" should be "(2001)".

p. 84, Problem 24(b). Should be "given $Y = y$, $Z \sim \mathcal{B}(n, y)$, $n \geq 2$; and $Y \sim \beta(r, s)$. Find $\mu_0(z)$ when (i) $w(y, z) = 1$, and (ii) $w(y, z) = y(1 - y)$, $0 < y < 1$."

Hint: See Example 1.2.9.

p. 86, l. 9. $\frac{\partial}{\partial\theta} L_X(\theta)$ should be $\frac{\partial}{\partial\theta} logL_X(\theta)$.

p. 88, l. -14. parameter

p. 89, l. -1. After "fixed time." add "The lifetimes are assumed to be exponentially distributed.".

p. 90, Hint to Prob. 1.6.16(ii). After "degrees of freedom," insert "$Y_0 = 0$".

p. 90, Hint to Prob. 1.6.16(ii). "$\sum_{i=1}^{t} Z_i$" should be "$\sum_{i=1}^{r} Z_i$".

p. 90, Prob. 1.6.17, l. 3. "$\mathbf{c}_{l\times 1}$" should be "$\mathbf{c}_{k\times 1}$".

p. 90, l. 8. Should be "π_L is the projection matrix onto $\mathcal{L} = \{\boldsymbol{\eta} : \boldsymbol{\eta} = B\boldsymbol{\theta}, \boldsymbol{\theta} \in R^l\}$.".

p. 90, Prob. 1.6.19, l. 6. "$\mathbf{z}_1, \cdots, \mathbf{z}_d$" should be " the d $1 \times n$ rows of the matrix $[\mathbf{z}_1, \cdots, \mathbf{z}_n]_{d\times n}$.

p. 91, Prob. 27. "genrated" should be "generated".

p. 91, Prob. 1.6.28. "information in theory" should be "information theory".

p. 91, Prob. 28. There needs to be dx in the last integration.

p. 91, Prob. 29. l. 3 " the $p(p + 3)/2$ dimensional canonical exponential family."

p. 91, Prob. 1.6.29. "$\mathbf{Y}_{ij}$" should be "Y_{ij}".

p. 97, l. 6. "Statistics, 2000" should be "Statistics, 2001".

p. 99, Formula (2.1.1). The gradient should be evaluated at the point $\boldsymbol{\theta} = \boldsymbol{\theta}_0$.

p. 107, l. 3. "$X \times H$" should be "$X \times \Theta$".

p. 108, l. 8. Add the condition "$\text{Var}(\epsilon_i) < \infty$".

p. 109, l. 16: "$(\mathbf{z} - \mathbf{z}_0)$" should be "$(z_j - z_{0j})$"

p. 109, l. 17: "for $\mathbf{z}_0$ an interior" should be "for $\mathbf{z}_0 = (z_{01}, \ldots, z_{0d})^T$ an interior".

p. 109, l. 17: "$\frac{\partial\mu}{\partial z_j}(\mathbf{z}_0)\mathbf{z}_0$" should be "$\frac{\partial\mu}{\partial z_j}(\mathbf{z}_0)z_{0j}$".

p. 113, The expression for $\hat{\beta}_1$ on the middle of the page. Drop $\frac{1}{n}$'s (both of them).

p. 113, l. -11. "Example 2.2.1" should be "Example 2.1.1".

p. 115, l. -9. and -8. Change "This estimate ..." to "Note that $P(X_{(n)} = \theta) = 1 - P(\text{all } X_i < \theta) = 1 - [(\theta - 1)/\theta]^n \to 1$ as $n \to \infty$".

p. 120, l. 16. After "model $\mathcal{P}_0$" insert "(see (2.2.1))".

p. 124, l. 10. "$\hat{\theta}_1 = \sqrt{n_1}/n$" should be "$\hat{\theta}_1 = \sqrt{n_1/n}$".

p. 125, Formula (2.3.7). Formula is short one right parenthesis.

p. 128, Thm. 2.4.1. ..."The interior of the convex support of p_T." (Delete (a, b).)

Proof. After "$f(b-)$" insert "if $\mathcal{E} = (a, b)$".

p. 128. Step (3) of bisection algorithm should add "and return x_{final}".

p. 130, Ex. 2.4.2. "$\hat{b}_{\text{old}}$" should be "$\hat{p}_{\text{old}}$".

p. 132, (2.4.3). There is one extra parenthesis at the end.

p. 132, l. -3. "noncave" should be "non-concave".

p. 135, Lem. 2.4.1. "...and θ_{OLD} maximizes $J(\theta \mid \theta_{\text{OLD}})$."

p. 137, Ex. 2.4.26. "$\hat{\theta}_{\text{NEW}} = \frac{2N_{1m}+N_{2m}}{2n} + M_n/(2 - \hat{\theta}_{\text{OLD}})n$."

p. 137, Eqn after (2.4.26). $\theta^2 - \left(\frac{2+2N_{1m}+N_{2m}}{2n}\right)\theta + \frac{2N_{1m}+N_{2m}+M_n}{n} = 0.$

p. 137, l. 5. "Problem 2.4.12" should be "Problem 2.4.15".

p. 137, l. -5. Replace "and find (Problem 2.4.1)" with "It may be shown directly (Problem 2.4.1)...".

p. 138, l. 5-6. Delete the sentence beginning with "Because".

p. 141, Prob. 13(b)(iii). "Raleigh" should be "Rayleigh".

p. 143, Prob. 2.2.6(a). "$E(Y_i) = \alpha z_j$ where the z_j" should be "$E(Y_i) = \alpha z_i$ where the z_i".

p. 143, Prob. 2.2.7. "equations (2.1.5)" should be "equations (2.1.7)".

p. 151, l. -4. "$h(z; \lambda)$" should be "$h(z; \boldsymbol{\lambda})$".

p. 152, Prob. 2.3.4. "...of Corollary 2.3.1".

p. 153, l. 1. "heterogenous" should be "heteroscedastic".

p. 153, 8b). "$\alpha = 1$ and $p = 1$."

p. 157, l. -3. "$q(y, \theta_0)$" should be "$q(s, \theta_0)$".

p. 158, l. 7. Replace "Limitations ... algorithm" with "*Limitations of the Missing Value Model of Example 2.4.6.* The assumptions underlying Example 2.4.6...".

p. 158, 2.5.15. "Example 2.4.4".

p. 158, l. -17. Change "$Y_i \leq 2$" to "$Y_i \geq 2$".

p. 162, l. 3. Insert "minimum" before "Bayes risk".

p. 162, End of Paragraph 1. "Bayes procedure" should be "Bayes procedures".

p. 162, Beginning of Paragraph 3. "formulae (1.2.8)" should be "formula (1.2.8)".

p. 167, Ex. 3.2.4. "and μ and the vector $\Delta \ldots$ is independent" should be "and μ and the vector $\Delta \ldots$ are independent".

p. 169, l. 7. Insert "σ^{-2}" in front of "$\frac{1}{2}n(a-\theta)^2$".

p. 169, l. -2. "require" should be "requires".

p. 169, l. -18. "(2000)" should be "(2001)".

p. 170, l. 7. Possibly randomized *not* permitted.

p. 170, l. 12. $\bar{\mathcal{D}} = \{$set of all *randomized* decision procedures$\}$.

p. 172, Top of Page. "$R(\pi^{**}, \delta^{**})$" should be "$r(\pi^{**}, \delta^{**})$".

p. 172, l. -5. In the integral of formula (3.3.13) replace "$r(\theta, \delta)$" with "$R(\theta, \delta)$".

p. 174, Thm. 3.3.3. In statement "$\cdot$" after "prior distributions", eliminate "such that $\pi_k\{\theta : R(\theta, \delta^*) = r\} = 1$, and". Continue "Let ...". First line in the proof should be "By assumption".

p. 175, l. 2 and 3. Replace "Then $\ldots = \sigma^2/n$" with "We know that $R(\theta, \overline{X}) = \sigma^2/n$".

p. 182, Ex. 3.4.2. Strike "then".

p. 186, l. -7. Change "$\log p(x, \theta)$" to "$\log p(X, \theta)$".

p. 186, l. -6. Change "$\sum_{\boldsymbol{Z}_Y}^{-1}$" to "$\sum_{\boldsymbol{Z}_Y}^{T}$".

p. 190, Section 3.5.3. Missing period at end of paragraph 2.

p. 194, l. 9 Should be "If $[n\alpha] = [(n-1)\alpha]$ and $x^{([n\alpha])} = -x^{(n-[n\alpha])}$".

p. 195, l. 17 "$(n^{-1}x)^2$" should be "$(n-1)(n^{-1}x)^2$".

p. 195, l.18 & 19: "$\frac{1}{n^2}$" should be "$\frac{n-1}{n^2}$".

p. 196, Remark 3.5.1. "$\Delta_x(t) = 1[t \leq x]$" should be "$\Delta_x(t) = 1[t \geq x]$".

p. 197, Pr. 4. After prior on λ add "and use squared error loss $(\lambda - a)^2$".

p. 197, Pr. 5. (b) c should be $c_w(x)$, and $c_w(x) = \int p(x|\theta)[\pi(\theta)/w(\theta)]d\theta$.

p. 198, Prob. 8, Hint for (a). "Cov$(\boldsymbol{\theta}_j, \boldsymbol{\theta}_j)$" should be "Cov$(\boldsymbol{\theta}_i, \boldsymbol{\theta}_j)$".

p. 201, Prob. 3.3.7. After "Show that" add "if".

p. 203, Prob. 3.4.2. "$E(\delta(X) \mid t(X))$" should be "$E(\delta(X) \mid T(X))$".

p. 203, Prob. 3.4.5. "$\mu - \mu_0$" should be "$\mu = \mu_0$".

p. 203, l. -1. After inadmissible add "under squared error loss".

p. 206, Prob. 22:(ii). Change "the information bound is infinite" to "$I(\theta) = 1/\theta^2$".

p. 206, Prob. 22:(iii). Change "has finite variance" to "Var$2x = 1/3\,\theta^2 < \theta^2$".

p. 212, l. 5,6. "mimimum" should be "minimum". "2000" should be "2001".

p. 212, 3rd reference. Insert "**96**, 746–774".

p. 214, l. 11. $\mathbf{N}_d = (N_{m1d}, N_{m0d}, N_{f1d}, N_{f0d})$ are independent with corresponding distributions $\mathcal{M}(n_d, p_{m1d}, p_{m0d}, p_{f1d}, p_{f0d})$, $1 \leq d \leq D$.

p. 216, l. 16. Insert "As we discussed in Section 1.3 . . ." at the beginning of the sentence.

p. 217, l. 10. Insert "As we have noted in Section 1.3" before "Such tests. . .".

p. 218, Remark 4.1. Replace "the level and size of the test" by "the size of the test".

p. 219, l. 15. "some equivalent" should be "some other".

p. 219, l. 18. Replace $d\left(\frac{X}{n}, \theta_0\right)$ by $d\left(\frac{X}{n}, [0, \theta_0]\right)$.

p. 222, l. -5, -6. "$2n$" should be "$2r$".

p. 224, l. -4. "is 0 or 1" should be "is 0 or in $(0, 1]$".

p. 226, Example 4.2.2, l. 4. "$(\mathbf{x} - \mu_1)$" should be "$(\mathbf{x} - \boldsymbol{\mu}_1)$". "$(\mathbf{x} - \mu_0)$" should be "$(\mathbf{x} - \boldsymbol{\mu}_0)$".

p. 226, l. -15. Shall read: $Q = (\mathbf{X} - \boldsymbol{\mu}_0)^T \Sigma_0^{-1} (\mathbf{X} - \boldsymbol{\mu}_0) - (\mathbf{X} - \boldsymbol{\mu}_1)^T \Sigma_1^{-1} (\mathbf{X} - \boldsymbol{\mu}_1)$.

p. 228, l. 7. Change "$P(N_1 \leq c)$" to "$P(N_\ell \leq c)$".

p. 228, Ex. 4.3.3. $\eta(\mu) = \sqrt{n}\mu/\sigma$.

p. 228, l. -1. "$\theta > \theta_1$" should be "$\theta > \theta_0$".

p. 229, l. 17. "most serious error" should be "more serious error".

p. 229, l. 20. "$-\frac{1}{2}\log(2\pi\sigma^2)$" should be "$-\frac{n}{2}\log(2\pi\sigma^2)$".

p. 229, Ex. 4.3.5. "test δ^* with reject. . ." should be "test δ^* which rejects. . .".

p. 232, Paragraph before Ex. 4.3.7. "invariance consideration" should be "invariance considerations".

p. 233, l. -9,-10. Delete the sentence beginning with "We also show that " and replace

"Finally, we show" with "We also show".

p. 234, First equation at the top. $\geq$ should be $\leq$.

p. 235, Second inequality at top. "$P[\bar{\nu}(X) = \nu]$" should be "$P[\bar{\nu}(X) \geq \nu]$".

p. 236, l. 22, 24, 25. (4.1.1) should be (4.4.1).

p. 236, l. 26. "larger than $1 - \alpha$" should be "smaller than $1 - \alpha$".

p. 237, Ex. 4.4.3. The first equation should use $\approx$, not equality.

p. 237, l. 5. "s" should be "s^2".

p. 238, l. -11. "$n = \frac{k_\alpha}{l_0} - k_\alpha^2$" should be "$n = \left(\frac{k_\alpha}{l_0}\right)^2 - k_\alpha^2$".

p. 239, Ex. 4.4.4. "internet subscribers" should be "Internet subscribers".

p. 239, l. -3. The pairs referred to should be "$(\underline{q}_1, \overline{q}_1), \ldots, (\underline{q}_r, \overline{q}_r)$".

p. 240, Ex. 4.4.5. Change the two sentences at the end of this example to "The exact confidence coefficient is given in Problem 4.4.15."

p. 241, Ex. 4.4.7. "case F supported..." should be "case of F supported...". The right parenthesis after 1992 should actually be a comma, and a right parenthesis should come before the period at the end of the sentence.

p. 242, l. -12. At the right-hand side of the expression, "$(1 - \alpha)$" should be "α".

p. 243, l. -15. is a confidence interval .

p. 243, l. 10. Change "$\nu_0 \in \mathcal{V}$" to "$\nu_0 \in \mathcal{N}$".

p. 243, Proof of Thm. 4.5.1. In the second equation, "$s(t)$" should be "$S(t)$".

p. 244, In the second line of Example 4.5.2. Replace "Binomial" and "binomial" with "Bernoulli".

p. 244, l. 11. "of a test δ" should be "of a level α test δ".

p. 244, l. 13. It should be $\geq$ inside the $C = \{\ \}$.

p. 244, l. -7. Replace "level $(1 - \alpha)$ test" with "level α test".

p. 245, l. -8. "point o" should be "point of".

p. 247, Ex. 4.5.2. In the second paragraph, the parameter of interest is mistakenly changed to "θ".

p. 248, Ex. 4.6.1. Define k as the largest integer such that $P(S \geq k) \geq (1 - \alpha)$.

p. 248, Formula (4.6.2). The two $\leq$'s inside the brackets should both be $\geq$'s.

p. 249, l. 7: "Defined" should be "Define".

p. 249, l. -13. is a UMA .

p. 251, In the second line of Definition 4.7.2. "$\pi(\cdot|x)$" should be "$\pi(\theta|x)$".

p. 252, Ex. 4.7.2, l. 8. Change "$(n-1)s^2$" to "t".

p. 252, Ex. 4.7.2, l. 9,10. Change "$(n-1)s^2/x_{n-1}(\alpha)$ of Example 4.4.2" to "$t/x_n(\alpha)$".

p. 253, l. 10. $E([\hat{Y}-\mu]+[Y-\mu])^2$ should read $E([\hat{Y}-\mu]-[Y-\mu])^2$.

p. 253, l. -7. "$Z(Y)$" should be "$Z_p(Y)$".

p. 254, l. 6. "valid from samples..." should be "valid for samples...".

p. 255, l. 10,15. "σ_B^2" should be "$\hat{\sigma}_B^2$".

p. 256, l. -14. "θ_0 is of smaller" should be "Θ_0 is of smaller".

p. 258, l. 17. Reference should be: See Example 2.2.9.

p. 259, One-third from top. "...is monotone increasing function..." should be "...is a monotone increasing function...".

p. 261, l. -8. versus K .

p. 264, l. -9. we are led to .

p. 270, Prob. 4.1.6. There is no b). Delete a).

p. 270, l. -12. Remove the word "complete".

p. 271, Problem 9, l. 8. "the test that rejects H iff $T \geq T_{(B+2-m)}$ has level $m/(B+1)$".

p. 271, Prob. 9. "Show that the test rejects H..." should be "Show that the test that rejects H...". "Next let $T^{(1)}, \ldots, T^{(B+1)}$" should be "Next let $T_{(1)}, \ldots, T_{(B+1)}$" and "$T \geq T^{(B+1-m)}$" should be "$T \geq T_{(B+1-m)}$".

p. 271, l. -1,-2. "Cramer" should be "Cramér".

p. 274, Problem 3. "χ^2_{2n}" should be "χ^2_n".

p. 276, Problem 12. "Theorem 4.3.2" should be "Theorem 4.3.1".

p. 278, Prob. 7, Hint. Reference to $\bar{X}_{n_0}$ should be to the previously defined $\bar{X}_0$. Similarly, s_{n_0} should be s_0.

p. 278, Problem 10(a). Should be "Show that this quadruple is sufficient".

p. 279, Prob. 4.4.15. Change the whole problem into " (a) Show that the confidence coefficient of the rectangle of Example 4.4.5 is

$$\int_a^b \left[2\Phi(\sqrt{\frac{1}{n-1}}\sqrt{\tau} \cdot c) - 1 \right] g(\tau) d\tau$$

where a is the $\frac{\alpha}{4}$th quantile of the χ^2_{n-1} distribution, b is the $(1-\frac{\alpha}{4})$th quantile of the χ^2_{n-1} distribution, c is the $(1-\frac{\alpha}{4})$th quantile of the $t-$distribution, and $g(\cdot)$ is the density function of the χ^2_{n-1} distribution. (b) Compute the expression for $\alpha = 0.05, 0.1$, and compare them to $1-\alpha$. Hint: Use Theorem B.3.3 and (B.1.30). Condition on $[(n-1)s^2/\sigma^2] = \tau$."

p. 280, Prob. 4.4.18. "Example 4.1.6" should be "Example 4.4.6".

p. 284, l. 1 and 2. Remove "100" from in front of "$x_{.95}$" and "$x_{.05}$".

p. 284, Pr. 13. Let $x_p = F^{-1}(p)$, $0 < p < 1$, be the $100p$th quantile of F. And "$100x_{.95}$" should be "$x_{.95}$", "$100x_{.05}$" should be "$x_{.05}$".

p. 284, Pr. 14. "disstribution" to "distribution"

p. 284, l. -1. Insert "$= 1-\alpha$" on the right.

p. 288, l. -1. It should be "$\pi(t) = sc^s/t^{s+1}$, $t > c$, $s > 0$, $c > 0$.

p. 290, Problem 1(b). "covers the true mean μ" should be "covers X_{n+1}".

p. 290, l. 19. "X_i/θ" should be "$2X_i/\theta$".

p. 295, References. Add the reference (see page 241): "Bickel, P. "Inference and auditing: the Stringer bound," Internat. Statist. Rev., 60, 197–209 (1992).".

p. 296, l. 1,2. Journal reference should be "Statistical Science", 101–128, 2001.

p. 296, l. 5. "Aarberge" should be "Aaberge".

p. 297–298. References to "S" should be to "s" (that's the usual notation).

p. 299, l. -10. Add after first sentence, "Without loss of generality, we assume $\mu = 0$."

p. 299, l. -3. "Esseen" should be "Esséen".

p. 300, Second paragraph from bottom. "...results such as are..." should be "...results such as these are...".

p. 302, Ex. 5.2.2. "$\hat{P}$" should be "$\hat{p}$".

p. 302, Sentence after Ex. 5.2.2. "suprising" should be "surprising".

p. 304, l. -2. $\inf\{D(\boldsymbol{\theta}_0, \boldsymbol{\theta}) : |\boldsymbol{\theta} - \boldsymbol{\theta}_0| \geq \epsilon\} > D(\boldsymbol{\theta}_0, \boldsymbol{\theta}_0)$.

p. 305, formula (5.2.14)-(i). "$|\rho(X_i, \theta) - D(\theta_0, \theta)|$" should be "$[\rho(X_i, \theta) - D(\theta_0, \theta)]$".

p. 305, l. 9. "$|\theta - \theta_0| \geq \delta$" should be "$|\theta - \theta_0| \geq]varepsilon$".

p. 306, "Summary". "...sequence of estimates) consistency." should be "...sequence of estimates), consistency.".

p. 306, l. 11: and derive consistency .

p. 309, l. -4. Change "Problem 5.3.4" to "Problem 5.3.3".

p. 310, l. -9. Change "$0(n^{-3})$" to "$O(n^{-3})$".

p. 311, l. 10. Change "in (5.3.12)" to "in (5.3.13)".

p. 311, l. 11. After "(Problem 5.3.12)", insert ", for $d = 2$".

p. 313, l. -10. "Theorem 5.2.2" should be "Proposition 5.2.1".

p. 315, l. 5: and $\sigma_1^2 = \sigma_2^2$.

p. 317, (5.3.19). $\mathcal{L}_\gamma[\sqrt{n}(h(\hat{\gamma}_n) - h(\gamma))] \to \mathcal{N}(0, c)$

p. 318, expression (5.3.20): "$r_n^{(2)}$" should be "r_n".

p. 318, l. 15: "$E(V_n)^3$" should be "$E(V - n)^3$".

p. 319, Example 5.3.6. In the third line, "$\hat{\sigma}_X^2 \hat{\sigma}_Y^2$" should be "$\hat{\sigma}_1^2 \hat{\sigma}_2^2$". In the ninth line, "$\frac{(x_i - \mu_1)}{\sigma}$" should be "$\frac{(x_i - \mu_1)}{\sigma_1}$".

p. 320, l. 1. "σ_1^2, σ^2" should be "σ_1^2, σ_2^2".

p. 328, l. 9: "a parameter as defined in Section 1.1" should be "a well defined parameter as defined in Section 1.1.2".

p. 330, l. -13. After "are called M-estimates" insert "as well as estimating equation estimates — see Section 2.2.1".

p. 331, l. 13. "(5.4.20)" should be "(5.4.30)".

p. 331, First lines of Section 5.4.3 and Theorem 5.4.3. Insert minus sign in front of $\ell(x, \theta)$ and $\log p(x, \theta)$.

p. 334, l. 8. Drop footnote 3. At the end of the sentence, add "–see Problem 5.4.5".

p. 336, l. -2. Turning to method .

p. 338, l. 15. It should read "denote the frequency of density function".

p. 344, l. -5. hypotheses specifying one point .

p. 347, Problem 7: "Show that the maximum" should be "Show that the minimum".

p. 347, l.-7,-10. "maximum contrast estimate" should be "minimum contrast estimate".

p. 348, l. -1. Change "$n^{-k/2}$" to "$n^{-m/2}$".

p. 349, l. 1. Change "$a_d \geq 0$, $0 \leq j \leq m$" to "$a_j \geq 0$, $0 \leq j \leq d$".

p. 349, l. 2,3. Change "$\sum_{j=1}^{m}$" to "$\sum_{j=1}^{d}$".

p. 349, Problem 5. Assume $E|X_1|^j < \infty$, change "$i_1, \ldots, i_j$, $j = 1, \ldots, n$" to "$1 \le i_k \le n$, $k = 1, \ldots, n$" and change "$E|X_1|$" to "$E|X_1|^j$".

p. 350, l.-9. Should be $\hat{\bar{X}}_R = \bar{X} - b_{opt}(\bar{U} - \bar{u})$.

p. 350, l.-5. "X_1" should be "X_i", and U_i are independent of ϵ_i.

p. 352, Problem 19(a). Should be "$h(\mu_1, \mu_2) + O(n^{-1})$".

p. 353, Pr. 23, l. 4. Change "$\frac{1}{2}h^{(2)}(\mu) + \frac{\sigma^2}{n}$" to "$\frac{1}{2}h^{(2)}(\mu)\sigma^2/n$".

p. 355, Pr. 30. Change "Lemma 5.3.3" to "Lemma 5.3.1". and "all integers k" to "all integers $k \ge 2$". After "i.i.d. vectors" add "with zero means".

p. 355, Pr. 31(b): "χ_{n-1}" should be "x_{n-1}".

p. 356, l. -3. "$f(\theta) = F'(\theta) > 0$ exists".

p. 358, l. -1: "(B.7.4)" should be "(B.7.5)".

p. 358, Problem 6: This problem needs to be rewritten.

6. Show that for the likelihood ratio statistic

$$\log \Lambda_n = \sum_{i=1}^{n} \log \frac{p(X_i, \hat{\theta}_n)}{p(X_i, \theta_0)} 1(\hat{\theta}_n > \theta_0)$$

- **a)** $\mathcal{L}_{\theta_0}(\log \Lambda_n) \to \mathcal{L}(U)$ **where** $U \sim Z^2 1(Z > 0)$ **where** $Z \sim \mathcal{N}(0, 1)$**.**
- **b)** $\mathcal{L}_{\theta_0 + \frac{\gamma}{\sqrt{n}}}(\log \Lambda_n) \to \mathcal{L}\left\{\frac{1}{2}\left(Z + \gamma I^{\frac{1}{2}}(\theta_0)\right)^2 1\left(Z > -\gamma I^{\frac{1}{2}}(\theta_0)\right)\right\}$**.**
- **c) Show that the level α likelihood ratio test has asymptotic power function which achieves equality in (5.4.50).**

p. 360, Problem 1(a). In the third line of 1(a), delete the "τ" before "$(1 + n\tau^2)^{-1/2}$" and before "$\overline{X}$". After "Hint:" insert "Set $T = \overline{X}$. Then

$$\pi(\boldsymbol{\mu} = 0|t) = \lambda p(t|0)/p(t) \text{ where } p(t) = \lambda p(t|0) + (1 - \lambda) \int_{-\infty}^{\infty} \varphi_\tau(\mu) p(t|\mu) d\mu.$$

p. 360, Problem 1(b). Should be "Show that $\tilde{\beta} \xrightarrow{P} 1$".

p. 361, Prob. 4. "extablish" should be "establish".

p. 368, l. 15. Should be "$j = 1, \ldots, p$".

p. 369, l. 16 & 17. "$\mathcal{L}(\boldsymbol{\eta}, \mathbf{u})$" should be "$l_{\mathbf{u}}(\boldsymbol{\eta})$".

p. 370, l. -10. Insert ", $i = 1, \ldots, r$" after "has $\eta_i = U_i$".

p. 371, l. -13. Insert "If $p = r$, then" in front of "$\hat{\beta}_j$ is the is the UMVU".

p. 373, l. 8. Replace "rank p" with "full rank".

p. 373, l. -1. "$\hat{\mu}$" should be "$\hat{\alpha}$".

p. 373, Ex. 6.1.2, last line. Change "$|\mathbf{Y} - \boldsymbol{\mu}|^2$" to "$|\mathbf{Y} - \hat{\boldsymbol{\mu}}|^2$".

p. 374, l. -4: "$H : 1 \leq q < r$" should be "$0 \leq q \leq r$".

p. 375, l. 4: should be $\lambda(Y) = \exp\{-\frac{1}{2\sigma^2}(|Y - \hat{\mu}|^2 - |Y - \hat{\mu}_0|^2)\}$.

p. 375, l. 10: Remove minus sign in fron of "$-\frac{1}{2\sigma^2}$".

p. 375, l. -3. Change "Write η_i" to "Write $\boldsymbol{\eta}$".

p. 378, l. 10. Change "and $\hat{\beta}_0$" to "and $\hat{\beta}_1$".

p. 378, (6.1.27). Omit "$(p - q)^{-1}$".

p. 379, l .10: "(6.1.30)" should be "(6.1.29)".

p. 381, l. 5. Change "$\mathbf{a}^T\boldsymbol{\mu}$" to "$\mathbf{a}^T\hat{\boldsymbol{\mu}}$".

p. 381, l. 8. Change "(U_i/σ^2)" to "(U_i/σ)".

p. 383, l. -19. $\sigma^2(\boldsymbol{Z}^T\boldsymbol{Z})^{-1}$.

p. 383, Ex. 6.1.2, Last line. Bold S

p. 386, l. 2. Insert minus sign in front of $\ell(x, \boldsymbol{\theta})$ and $\log p(x, \boldsymbol{\theta})$.

p. 387, l. 10. After "minimum contrast" insert "or M".

p. 389, l. 8. Change "$(Z_{11}, \ldots, Z_{1n})$" to "$(Z_{11}, \ldots, Z_{n1})$", and "$(Z_{j1}, \ldots, Z_{jn})$" to "$(Z_{1j}, \ldots, Z_{nj})$".

p. 389, l. 11,12 etc. Change "$Z_{21}, \ldots, Z_{p1}$" to "$Z_{12}, \ldots, Z_{1p}$" and "Z_{j1}" to "Z_{1j}".

p. 390, (6.2.31). $\int \boldsymbol{\Psi}(\mathbf{z}, y, \boldsymbol{\beta}, \sigma) dP$

p. 390, l. -9. Change "$c(f_0)$" to "$c(f_0, \sigma)$" twice.

p. 397, Theorem 6.3.3. The first two sentences should read "Suppose the assumptions of Theorem 6.3.2 and the previous conditions on $\boldsymbol{g}$ hold. Suppose the MLE $\hat{\boldsymbol{\theta}}_{0,n} \ldots$".

p. 404, l. -5. In the summation, replace "N_i" with "N_j".

p. 415, l. -3. "Z_i^T" should be "$\mathbf{Z}_i^T$".

p. 416, l. 14: "(6.5.10)" should be "(6.5.12)".

p. 423, Pr. 7. Change "(6.1.28)" to "(6.1.27)".

p. 425, Prob. 6.1.15(b). "$x = 0.0289$" should be "$s = 0.0289$".

p. 425, l. -1. "A5" should be "A6".

p. 426, Pr. 5. Change "$c(f_0)$" to "$c(f_0, \sigma)$".

p. 428, Pr. 11, l. 3,4. Change "$Z_i^{(j)}$" to "Z_{ij}" and "$\sum_{j=1}^{p}$" to "$\sum_{j=2}^{p}$". Line 6, change "β_j" to "γ_j" and insert "where $\gamma_j = \beta_j + c_j\beta_1$".

p. 429, l. -7. "$k(\theta_0, \theta_1)$ is a Kullback–Leibler in formation" should be "$K(\theta_0, \theta_1)$ is the Kullback–Leibler information".

p. 432, Problem 4(b). "$\theta_{12}/(\theta_{11} + \theta_{12})$" should be "$\theta_{11}/(\theta_{11} + \theta_{12})$".

p. 434, Problem 6.5.1. "proosed" should be "proposed".

p. 436, last line in Problem 436. Change "then it is" to "then it does".

p. 442, l. -11. we can assign .

p. 449, (A.7.8): remove "= 1".

p. 451, A.8.1. It should read "$X^{-1}(B)$ is in $\mathcal{A}\ldots$".

p. 452, l. -7. X has a marginal density .

p. 454, l. 6. "1_A" should be "$1(A)$".

p. 454, l. 7. "$1_A(\omega)$" should be "$1(A)(\omega)$".

p. 455, l. 6: "If $X = 1_A$" should be "If $X = 1(A)$".

p. 458, l. -8 and -13. "Schwartz" should be "Schwarz".

p. 460, expression (A.12.9): "c_γ" should be "c_j".

p. 463, l. 10. Insert "a" in front of "random variable".

p. 463, l. 16: $F(X - \mu)$ should be $F(x - \mu)$.

p. 464, (A.13.17). "$\sqrt{2\pi\sigma}$" should be "$\sqrt{2\pi}\sigma$".

p. 465, l. 1. "$e^{-\lambda}$" should be "$e^{-\lambda x}$".

p. 467, (A.14.13): extra right paren before first "(t)" .

p. 470, (A.15.10). Renumber as (A.15.11). Renumber unnumbered equation 7 lines above it as (A.15.10).

p. 471. Renumber (A.15.11) as (A.15.12).

p. 473. l. -10. and define .

p. 473, l. -2. remove extra = .

p. 478, (B.1.2). "p^y" should be "p^z".

p. 479, l. 4. "Bayes' Rule" should be "Bayes' theorem".

p. 479, (B.1.5) and below. "$n - z$" should be "$N - z$" and "θ^y" should be "θ^z".

p. 482, expression (B.1.22). "$\binom{Z}{n}$" should be "$\left(\frac{Z}{n}\right)$".

p. 482. l. -15. $(1-\theta)^{n-z}$ should be $(1-\theta)^{N-z}$.

p. 482. l. -9. Drop footnote 1.

p. 482. l. -1. "Bayes' Rule" should be "Bayes' theorem".

p. 485. The last five lines should be italicized.

p. 486, Thm. B.2.2. "$\mathbf{Y} = g(\mathbf{Y})$" should be "$\mathbf{Y} = g(\mathbf{X})$".

p. 487, l. 5: an example of the bivariate normal

p. 491, l. -6. "$(V/k)(W/m)$" should be "$(V/k)/(W/m)$".

p. 492, (B.3.7). "$S^{\frac{1}{2}(k-2)}$" should be "$s^{\frac{1}{2}(k-2)}$".

p. 492. l. 12. Drop footnote 1.

p. 495, (B.3.24). "N" should be "n".

p. 496, (B.3.26). "$\sum_{j=1}^{n} a_{ij}$" should be "$\sum_{j=1}^{n} a_{kj}$".

p. 498, l. 5. "$\mathrm{Cor}(X, Y)$" should be "$\mathrm{Corr}(X, Y)$".

p.502, l -15: "(Problem B.4.10)" should be "(Problem B.4.9)".

p.506, expression (B.5.19): "Σ" should be bold.

p. 507, l. 6: "(B.5.4)" should be " (B.5.3)".

p. 507, (B.6.5). "$|\det(\Sigma)|^{k/2}$" should be "$|\det(\Sigma)|^{1/2}$".

p. 508, l. -5: "$\mathbf{A\Sigma A'}$" should be "$\mathbf{A\Sigma A}^T$".

p. 508, l. -3: "coordinates of **D**" should be "coordinates of **U**".

p. 509, (B.6.11): on the RHS the superscripts (1) in the denominator be (2).

p. 509, Thm. B.6.5, last line. "$\mu^{(1)}-$" should be "$\mu^{(1)}+$".

p. 510, l. 6: "Theorem B.6.5" should be "Theorem B.6.4".

p. 512, 513, and 514. The subscript "n" should not be bold.

p. 514, Theorem B.7.5 Dominated Convergence Theorem. It should be "If $\{W_n\}$, W and V are random variables with $W_n \xrightarrow{P} W$, $\mathrm{P}[|W_n| \leq |V|] = 1$ and $E|V| < \infty$, then $\mathrm{E}W_n \to \mathrm{E}W$."

p. 516: the subscripts on "o" and "O" should be capital P.

p. 518, l. 11. "to strictly convex" should be "to be strictly convex".

p. 519, l. -5. "The "if" part of (a)" should be "the "only if" part of (a)".

p. 525, Prob. B.1.8. (iv) and (v) should read:

$$\text{(iv) } Y \sim \mathcal{U}(-1,1),\ Z = Y^2$$

$$\text{(v) } Y \sim \mathcal{U}(-1,1),\ Z = Y^2 \text{ if } Y^2 < \frac{1}{4} \text{ and } Z = \frac{1}{4} \text{ if } Y^2 \geq \frac{1}{4}$$

p. 525, Prob. B.9(b). "X and Y in Problem B.1.8(c)(i)" should be "Z and Y in Problem B.1.8(i)".

p. 526, l. 5. Replace the hint by: Divide the numerator and denominator of the expression for $P[Z = z \mid Y = y]$ on page 479 by $\binom{N}{n}\binom{n}{y}\theta^y(1-\theta)^{n-y}$. This gives the required binomial probability in the numerator. Since the binomial probabilities add to one, the denominator must be one.

p. 528, l. 8: $(X_{(1)}, ..., X_{(n)})^T$ should be $(X_{(1)}, ..., X_{(r)})^T$.

p. 530, l. -4: "$\sum_{i=1}^{\infty}$" should be "$\sum_{i=0}^{\infty}$".

p. 534, Prob. B.5.3. "$t_i^{i_1}$" should be "$t_1^{i_1}$".

p. 534, l. -8: The t in "$K_U(t)$" should be bold.

p. 535, l. 3: "$-2\sigma_{11}$" should be "$-2\sigma_{11}^2$".

p. 535, l. -13. i_{k_m} should be i_{k+m}.

p. 535, Prob. B.6.3, last line. "Σ_{22}" should be "Σ_{22}^{-1}".

p. 536, Problem 11. "in Theorem B.7.6" should be "in Theorem B.7.7".

p. 543. Label on the top figure should be $Pr(Z \geq z)$.

p. 548, l. -16. "Cauchy–Schwartz" should be "Cauchy–Schwarz".

p. 549, l. -13. "Cramer" should be "Cramér".

p. 550, l. 12. "Marakov" should be "Markov".