From finite sample to asymptotic methods in statistics - Errata

This page lists some typos and errors that were sent by readers or found by the authors. In particular, we have received several corrections from Prof. Nelson Ithiro Tanaka. If you find an error, please send a note to acarlos@ime.usp.br.

- Page 3
  - Line 14: **Replace** "...in item (b)." **by** "...in item (a)"
  - Line -16: **Replace** "$\Delta = \mu_X - \mu_Y$" **by** "$\Delta = \mu_Y - \mu_X$"
- Page 16
  - Expression 1.5.3: **Replace** "$-A_{11}A_{12}A_{22.1}^{-1}$" **by** "$-A_{11}^{-1}A_{12}A_{22.1}^{-1}$"
- Page 67
  - Exercise 2.3.8: **Replace**

    $$\boldsymbol{x}'\boldsymbol{A}^{-1}\boldsymbol{x} = \boldsymbol{x}_1'\boldsymbol{A}_{11}^{-1}\boldsymbol{x} + \boldsymbol{x}_{2:1}'\boldsymbol{A}_{22}^{-1}\boldsymbol{x}_{2:1}$$

    by

    $$\boldsymbol{x}'\boldsymbol{A}^{-1}\boldsymbol{x} = \boldsymbol{x}_1'\boldsymbol{A}_{11}^{-1}\boldsymbol{x}_1 + \boldsymbol{x}_{2:1}'\boldsymbol{A}_{22:1}^{-1}\boldsymbol{x}_{2:1}$$
  - Exercise 2.4.2: **Replace**

    $$f(x;\boldsymbol{\theta}) = (1/\sqrt{\theta_2})\theta_1^{\theta_2}[\exp(-\theta_1 x)]x^{\theta_1 - 1}$$

    by

    $$f(x;\boldsymbol{\theta}) = [1/\Gamma(\theta_2)]\theta_1^{\theta_2}[\exp(-\theta_1 x)]x^{\theta_2 - 1}$$
- Page 75
  - In expression on line 12, the numerator is $\sqrt{n}\ \overline{X}_n$
- Page 89
  - Last line in expression 4.3.4: It should be

    $$= P(A \mid B_i)P(B_i)/\sum_{j\in I} P(B_j)P(A \mid B_j),$$
  - Last 5 lines: Following the notation adopted in the book, all expectations should be typed as $\mathbb{E}$.

- Page 98
  - Exercise 4.3.3: The distribution for $\pi(\theta)$ should be *inverse* gamma
- Page 110
  - Section 5.3, second line: Consider

$$P(X_n = 1) = p = 1 - P(X_n = -1)$$

- Page 118
  - Exercise 5.2.1: **Replace** "Set $U_n = \sum_{k=1}^{n-1} X_k^2$ and ..." **by** "Set $U_n = \sum_{k=2}^{n} X_k X_{k-1}$, $V_n = \sum_{k=1}^{n-1} X_k^2$ and ..."
  - Exercise 5.3.2: **Replace by** $\sqrt{\frac{2}{\pi n}}$
  - Exercise 5.4.2: **Replace** $X_{\tau+1} - X_\tau$ **by** $X_{\tau+t} - X_\tau$ everywhere in the exercise.
- Page 123
  - Line 19: **Replace** "...for every $\eta > 0$, $\varepsilon > 0$, there exists a positive integer $n(\varepsilon, \eta)$, such that..." **by** "...for every $\eta > 0$, there exists $K = K(\eta)$ and a positive integer $n(\eta)$, such that..."
- Page 133
  - Last line: **Replace**

$$\frac{\partial^2}{\partial w^2} \log g(w)|_{w=w^*} = [(\pi + \varepsilon)^{-1} - 1]\pi^2/(1-\pi)^2 > 0,$$

  by

$$\frac{\partial^2}{\partial w^2} \log g(w)|_{w=w^*} = [(\pi + \varepsilon)^{-1} - 1]\pi^2(1 - \pi - \varepsilon)^2/(1-\pi)^2 > 0,$$

- Page 136
  - Line -9: **Replace** $P(|\overline{X} - \mu| > \varepsilon)$ **by** $P(|\overline{X}_n - \mu| > \varepsilon)$
- Page 147

- Line 15: **Replace**

$$P\left(\max_{M\le k\le N}|\overline{X}_n-\overline{\mu}_n|>\varepsilon\right)=\cdots$$

by

$$P\left(\max_{M\le k\le N}|\overline{X}_k-\overline{\mu}_k|>\varepsilon\right)=\cdots$$

- Page 162
  - Line 25: **Replace** "...with the s_k^2 being replaced by..." **by** "...with the T_k^2 being replaced by..."
- Page 170
  - Exercise 6.2.4: **Replace** (1.5.49) **by** (1.5.59).
  - Exercise 6.2.7: **Replace** "Consider the Bin(n,p) distribution. Let $T=\pi$ and consider the estimator $T_n=n^{-1}X_n$" **by** "Let X_n have the Bin(n,π) distribution and then, consider the estimator $T_n=n^{-1}X_n$.
- Page 182
  - Line -7: **Replace**"...apply the Jensen Inequality (1.5.40) to conclude..." **by** "...apply the Jensen Inequality (1.5.43) to conclude..."
- Page 190
  - Line 3: **Replace** "...suppose that $s_n\to\infty$ as..." **by** "...suppose that $\tau_n\to\infty$ as..."
- Page 192
  - Line 3: **Replace**

$$=\frac{1}{\sigma^2}\sum_{i=1}^{n}c_{ni}^2\mathbb{E}[(Y_i-\mu)^2I(|Y_i-\mu|>\varepsilon\sigma/c_{ni})]$$

by

$$=\frac{1}{\sigma^2}\sum_{i=1}^{n}c_{ni}^2\mathbb{E}[(Y_i-\mu)^2I(|Y_i-\mu|>\varepsilon\sigma/|c_{ni}|)]$$

- Page 195
  - Line 5: **Replace**...to show that $n^{-1/2}\sum_{i=1}^{n}\boldsymbol{\lambda}'(\boldsymbol{X}_i-\boldsymbol{\mu}_i)$... **by** ...to show that $n^{1/2}\sum_{i=1}^{n}\boldsymbol{\lambda}'(\boldsymbol{X}_i-\boldsymbol{\mu}_i)$...
  - Line 9: **Replace**...for every $\boldsymbol{\lambda}\in\mathbb{R}^p$, $n^{-1/2}\sum_{i=1}^{n}\boldsymbol{\lambda}'(\boldsymbol{X}_i-\boldsymbol{\mu}_i)$... **by**...for every $\boldsymbol{\lambda}\in\mathbb{R}^p$, $n^{1/2}\sum_{i=1}^{n}\boldsymbol{\lambda}'(\boldsymbol{X}_i-\boldsymbol{\mu}_i)$...

- Page 200
  - Line 11: **Replace** $\longrightarrow$ **by** $\Longrightarrow$ **in the expression.**

- Page 203
  - Line 16: **Replace**

    $$\le P(X_n \le x-c+\varepsilon)+P(|Y_n-c|>\varepsilon.$$

    by

    $$\le P(X_n \le x-c+\varepsilon)+P(|Y_n-c|>\varepsilon).$$

- Page 210
  - Line -3: **Replace**

    $$\sqrt{n}[g(T_n)-g(\theta)]/\sigma g'(\theta) \xrightarrow{\mathcal{D}} \mathcal{N}(0,1).$$

    by

    $$\sqrt{n}[g(T_n)-g(\theta)]/[\sigma g'(\theta)] \xrightarrow{\mathcal{D}} \mathcal{N}(0,1).$$

- Page 212
  - Line 9, expression (7.5.37): **Replace**

    $$\sum_{i=1}^{p}(x_i-y_i)\tilde{g}_i(\boldsymbol{x},\boldsymbol{y}),$$

    by

    $$\sum_{i=2}^{p-1}(x_i-y_i)\tilde{g}_i(\boldsymbol{x},\boldsymbol{y}),$$

- Page 213
  - Line 16: **Replace** "$1/2\mu\sigma$ exist;" **by** "$(2\mu\sigma)^{-1}$ exist;"

- Page 214
  - Lines 8 and 9: **Replace** $O_p(n^{-1})$ **by** $O_p(n^{-1/2})$ at the end of both expressions.
  - Line -6: **Replace**
    $$\overset{\bullet}{g}_3(\boldsymbol{x}) = (x_1x_2)^{-1}$$
    by
    $$\overset{\bullet}{g}_3(\boldsymbol{x}) = (x_1x_2)^{-1/2}$$
  - Line 22: **Replace**
    $$G_n(\boldsymbol{\lambda}) \xrightarrow{\mathcal{D}} \mathcal{N}[0, \boldsymbol{\lambda}'\overset{\bullet}{\boldsymbol{g}}(\boldsymbol{\theta})\boldsymbol{\Sigma}\dot{\boldsymbol{G}}'(\boldsymbol{\theta})\boldsymbol{\lambda}]$$
    by
    $$G_n(\boldsymbol{\lambda}) \xrightarrow{\mathcal{D}} \mathcal{N}[0, \boldsymbol{\lambda}'\overset{\bullet}{\boldsymbol{G}}(\boldsymbol{\theta})\boldsymbol{\Sigma}[\overset{\bullet}{\boldsymbol{G}}]'\boldsymbol{\lambda}]$$
- Page 219
  - Line 5: **Replace** "*if and only if,* $\boldsymbol{A}$ *is a generalized inverse* $\boldsymbol{\Sigma}$" **by** "*if and only if,* $\boldsymbol{A}$ *is a generalized inverse of* $\boldsymbol{\Sigma}$"
- Page 221
  - Expression for Q_m: Last $\mathbf{1}$ should be $\mathbf{1}_p$
  - Line 10: **Replace** "that it" **by** "that is"
- Page 227
  - Third line in Theorem 7.7.5: **Replace** "*Then there exist sequences of constants* $\{a_n\}$ *and* $\{b_n\}$*, such as* $n \to \infty$*,*" **by** "*Then there exists a sequence of constants* $\{b_n\}$*, such as* $n \to \infty$*,*"
  - Expression in the last line should be
    $$b_n = \Big[\frac{(-1)^m(m+1)!}{nF^{(m+1)}(\xi_1)}\Big]^{\frac{1}{m+1}}$$
- Page 230
  - Expression for b_n in item (i) should be $b_n = \{(m+1)!/[nF^{(m+1)}(\xi_0)]\}^{\frac{1}{m+1}}$;
- Page 236

– Integral in Theorem 7.8.3: The differential operator should be d and not d.

- Page 237

  – Line 1: **Replace**(ii)$\max_{i \le i \le n}(\pi_n^{-1}\pi_{ni})$ **by** $\max_{1 \le i \le n}(\pi_n^{-1}\pi_{ni})$

  – Exercise 7.1.3: First expression for the variance of T_n should be $\mathbb{V}\text{ar}(T_n) = \overline{\pi}_n(1 - \overline{\pi}_n) - \sum_{i=1}^{n}(\pi_{ni} - \overline{\pi}_n)^2$.

- Page 242

  – Expression (8.2.12): Replace $\sup_{|u| \le \delta}$ by $\sup_{|u| \le K}$

- Page 244

  – Expression (8.2.29): Replace K by δ in the variation set for $||\boldsymbol{u}||$, that is,

$$\xi_\delta = \mathbb{E}\left\{ \sup_{||\boldsymbol{u}|| \le K} [||\dot{\boldsymbol{\psi}}(X, \boldsymbol{\theta} + \boldsymbol{u}) - \dot{\boldsymbol{\psi}}(X, \boldsymbol{\theta})||] \right\} \to 0 \text{ as } \delta \to 0,$$

  should be

$$\xi_\delta = \mathbb{E}\left\{ \sup_{||\boldsymbol{u}|| \le \delta} [||\dot{\boldsymbol{\psi}}(X, \boldsymbol{\theta} + \boldsymbol{u}) - \dot{\boldsymbol{\psi}}(X, \boldsymbol{\theta})||] \right\} \to 0 \text{ as } \delta \to 0,$$

- Page 247

  – **Replace** $\boldsymbol{\theta}$ and $\widetilde{\boldsymbol{\theta}}$ **by** θ and $\widetilde{\theta}$ respectively

- Page 251

  – Line 13: σ should be squared:

$$\sqrt{n}[(\overline{X}_n, s_n^2) - (\mu, \sigma^2)]' \xrightarrow{\mathcal{D}} \mathcal{N}_2(\mathbf{0}, \boldsymbol{\Gamma})$$

- Page 258

  – Expression (8.5.4): **Replace** $\boldsymbol{D}(\widehat{\boldsymbol{\theta}}_n)$ **by** $\mathbb{V}\text{ar}(\widehat{\boldsymbol{\theta}}_n)$ **in the expression**.

- Page 263

- Line 12: **Replace**

$$\sqrt{n}(\widehat{\boldsymbol{\theta}}_n - \boldsymbol{\theta}_0) \xrightarrow{\mathcal{D}} \mathcal{N}\{\mathbf{0}, [\boldsymbol{I}(\boldsymbol{\theta}_0)]^{-1}\};$$

  by

$$\sqrt{n}(\widehat{\boldsymbol{\theta}}_n - \boldsymbol{\theta}_n) \xrightarrow{\mathcal{D}} \mathcal{N}\{\mathbf{0}, [\boldsymbol{I}(\boldsymbol{\theta}_0)]^{-1}\};$$

- Line 21: **Replace** $\boldsymbol{I}(\boldsymbol{\theta}_0)^{-1}$ **by** $\boldsymbol{I}(\boldsymbol{\theta}_0)$ in the asymptotic distribution of the left-hand side of (8.6.8).
- Line -7: The right-hand side of (8.6.8) converges in probability to $-\boldsymbol{I}(\boldsymbol{\theta}_0)\boldsymbol{\delta}$.

• Page 282

- Line 11: **Replace** This implies that $\widetilde{\boldsymbol{\theta}}_n - \widetilde{\boldsymbol{\theta}}_n = O_p(\boldsymbol{n}^{-1})$ **by** $\widehat{\boldsymbol{\theta}}_n - \widetilde{\boldsymbol{\theta}}_n = O_p(n^{-1})$

• Page 283

- Lines 13 and 14: **Replace** $\widehat{Q}_W$, $\widehat{Q}_N$ or $\widehat{Q}_V$ **by** $\widehat{Q}_W$ or $\widehat{Q}_N$.

• Page 285

- Line 18: **Replace** $\widehat{V}_n$ **by** $\widehat{\boldsymbol{V}}_n$ in the expression.
- Line -10: **Replace** Bhapkar (1966) showed that $\widehat{Q}_W$ is algebraically identical to $\widehat{Q}_N$ up... **by** Bhapkar (1966) showed that the Wald statistic is algebraically identical to $\widehat{Q}_N$

• Page 304

- Second line before Example 10.2.2: $\boldsymbol{\sigma}_n$ should be $\boldsymbol{\Sigma}_n$.