

Errors Discovered in the First Print

Chapter 2

p. 38, line 4. q_1 should be q_0 .

p. 23, fourth line below Definition 2.25. $\mathcal{S}_p \subset \mathcal{S}_q$ should be $\mathcal{S}_q \subset \mathcal{S}_p$.

p. 44, line 11. “if and only” should be “if and only if”.

Problem 6. $H(Y|X)$ should be $H(X|Y)$.

Problem 7. p'_x should be p'_X .

Problem 23. The first inequality should read $D(p||q) \geq cV^2(p, q)$.

Chapter 4

p. 83, the line below (4.10). “ $A_4 = 8$ ” should be “ $A_4 = 4$ ”.

Chapter 3

p. 74, line 11. “Fu et al. [125]” should be “Fu and Yeung [125]”.

p. 59, (3.50) and the remaining of the sentence should be

$$\tilde{X}_k - \tilde{X}_{i,j}, \tilde{X}_i \cap \tilde{X}_j - \tilde{X}_k, \tilde{X}_1 \cap \tilde{X}_2 \cap \tilde{X}_3, \text{ where } 1 \leq i < j \leq 3 \text{ and } k \neq i, j.$$

p. 60, the line below (3.60) should be “Now for any $1 \leq i < j \leq 3$ and $k \neq i, j$,”.

Chapter 6

p. 116, (6.29). = should be \leq because the summation is over \mathcal{S}_X which may be smaller than \mathcal{X} .

p. 132, **Strongly Typical Set:**

$$T_{[X]_\delta}^n = \left\{ \mathbf{x} \in \mathcal{X}^n : N(x; \mathbf{x}) = 0 \text{ for } x \notin \mathcal{S}_X \text{ and } \sum_x \left| n^{-1} N(x; \mathbf{x}) - p(x) \right| \leq \delta \right\}.$$

p. 133, Problem 6. The last line should be “for n sufficiently large, where ...”

Chapter 7

p. 157, Fig. 7.11. “upper bound” should be “lower bound”.

p. 161. In (7.160), the Markov chain should be $(\tilde{\mathbf{X}}(1), \tilde{\mathbf{X}}(2), \dots, \tilde{\mathbf{X}}(M), W) \rightarrow \mathbf{X} \rightarrow \mathbf{Y}$.

p. 161, (7.164) should read

$$\sum_{w'=1}^M \Pr\{W = w'\} I(\mathbf{Y}; \tilde{\mathbf{X}}(w) | \mathbf{X}, W = w') = 0.$$

In other words, the dummy variable in the summation should be w' instead of w .

p. 161, the intermediate step (7.166) is unnecessary.

p. 176, Problem 3, second line. “ $X_i = Y_i + Z_i$ ” should be “ $Y_i = X_i + Z_i$ ”.

Chapter 9

p. 187, line -2. $g(f(1)), g(f(2)), \dots, g(f(M))$ should be $g(1), g(2), \dots, g(M)$.

p. 216, the middle line in (9.41). $p(x|y) > 0$ should be $p(y|x) > 0$.

p. 217, line 7. $p(x|y) = 0$ should be $p(y|x) = 0$.

- p. 219, line 14. $I(X, \hat{X})$ should be $I(X; \hat{X})$.
- p. 219, lines 16 and 18. $(I(\mathbf{p}, \mathbf{Q}), D(\mathbf{p}, \mathbf{Q}))$ should be $(D(\mathbf{p}, \mathbf{Q}), I(\mathbf{p}, \mathbf{Q}))$.
- p. 220, line 1. $(R(D_s), D_2)$ should be $(D_s, R(D_s))$.
- p. 220, (9.64) and (9.65). In the infimum, $Q > 0$ should be $\mathbf{Q} > 0$.
- p. 222, (9.79) and two lines above. $(R(D_s), D_s)$ should be $(D_s, R(D_s))$.
- p. 222, (9.79) and one line below. $(I(\mathbf{p}, \mathbf{Q}^{(k)}), D(\mathbf{p}, \mathbf{Q}^{(k)}))$ should be $(D(\mathbf{p}, \mathbf{Q}^{(k)}), I(\mathbf{p}, \mathbf{Q}^{(k)}))$.

Chapter 10

- p. 232, eqn (10.25) should read $|Q| = |Q^\top| = \pm 1$.
- p. 241. Equation (10.101) should read

$$h(Y|X) = \int_{S_X} h(Y|X = x) dF(x) = -E \log f(Y|X).$$

Same typo in the chapter summary on p. 253.

- p. 242, line -7. “joint pdf” should be “continuous joint pdf”.
- p. 255. Problem 7 should read “For a continuous random variable X, \dots ”

Chapter 11

- p. 260, line -4. \mathcal{X}^n should be \mathfrak{R}^n .
- p. 261, Definition 11.10 should be

Definition 11.10 For all $1 \leq w \leq M$, let

$$\lambda_w = \Pr\{\hat{W} \neq w | W = w\} = \int_{\{\mathbf{y} \in \mathcal{Y}^n : g(\mathbf{y}) \neq w\}} f_{\mathbf{Y}|\mathbf{X}}(\mathbf{y}|e(w)) d\mathbf{y}$$

be the conditional probability of error conditional probability of error given that the message is w .

- p. 263, the line above (11.56). “and (n, M) code” should be “an (n, M) code”.
- p. 278, eqn (11.190). Q should be Q^\top throughout.
- p. 281, two lines below (11.208). “wired-line” should be “wireline”.
- p. 294, line 5. “the last section” should be “Section 11.6”.
- p. 296, Problem 3. $2^{-n(I(X;Y)-\delta)}$ should be $2^{-n(I(X;Y)+\delta)}$.
- p. 297, Problem 9. $Z(t) * h_2(t')$ should be $Z(t') * h_2(t')$.

Chapter 12

- p. 312, Definition 12.18. $\bigcup_{l=1}^k$ should be $\bigcup_{l=1}^m$.
- p. 319, (12.108) and (12.109). $\tilde{X}_{U_{A \cup (W \setminus S)}}$ should be $\tilde{X}_{U_{A \cup (W \setminus S)}}$.

Chapter 13

- p. 338, line -5. “Han [144]” should be “Han [148]”.

Chapter 16

- p. 398, two lines below Theorem 16.22. “strong conditional AEP” should be “conditional strong AEP”.

Chapter 18

Problem 1. $F_+(s) = F_-(t)$ should be $F_-(s) - F_+(s) = F_+(t) - F_-(t)$.
Problem 5. In lines 4 and 5, t_l should be t .

Chapter 19

p. 437, Section 19.2, line 6. “trivially” should be “triviality”.
p. 443, Section 19.3, (19.32). It should read $V_T = \langle \cup_{t \in T} \{\mathbf{f}_e : e \in \text{In}(t)\} \rangle$.
p. 446. In Figure 19(c), the global encoding kernel for channel (s,u) should be $[0 \ 0]^\top$ instead of $[1 \ 0]^\top$.
p. 450, line 13. The second $[y_i \ z_i]^\top$ should be $[y_j \ z_j]^\top$.
Problem 3(b), line 4. “obtaining” should be “obtained”.

Chapter 20

p. 488, eqn (20.14). “ K_S ” should be “ K_s ”.

Chapter 21

p. 534, one line above (21.241). “strong conditional AEP” should be “conditional strong AEP”.
Problem 8, second last line. Change (21.13) to $\Delta_t \leq |T|\epsilon, t \in T$.

Bibliography

References [180] and [335] can be merged. The author is Shunsuke Ihara.
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