

## 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. 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

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

- 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.

Last update by Raymond W. Yeung on May 10, 2014.