

# ERRATA

## Distributed Computing: Principles, Algorithms, and Systems

### Errata for Chapter 1

1. p 6 : line 4 from bottom: " $n/2\log_2 n$ " should read as " $(n/2)\log_2 n$ "

### Errata for Chapter 2

1. p 44: 8th line from bottom, remove extra unmatched ")" at the end of the line
2. p 44: 7th line from bottom: REPLACE " $SC_{ik}^{y_i, z_k}$ " BY " $SC_{ij}^{x_i, y_j}$ "
3. p 44: 7th line from bottom: REPLACE " $LS_k^{z_k}$ " BY " $LS_j^{y_j}$ "
4. p 47: line 10: REPLACE " $Min\_Past(e_j)$ " BY " $Min\_Future(e_j)$ "

### Errata for Chapter 3

1. p 53: **R1** bullet: REPLACE "an event (send, receive, or internal)" BY "a send or internal event"
2. p 55, line 4: REPLACE "loss causal" by "loss of causal"
3. p 55, Section 3.4.1, line 6: REPLACE " $p_j$  local" BY " $p_j$ 's local"
4. p 55: **R1** bullet: REPLACE "an event (send, receive, or internal)" BY "a send or internal event"
5. p 57, line 16: REPLACE "they are" BY "it is"
6. p 57, line 9 from bottom: REPLACE "cusality" BY "causality"
7. p 58, line 2: REPLACE " $\prec$ " BY " $\rightarrow$ "
8. p 58, line 3: REPLACE " $T(e) < T(f)$ , which" BY " $C(e) < C(f)$ "
9. p 58, line 6: REPLACE " $\prec$ " BY " $\rightarrow$ "
10. p 58, line 10: REPLACE " $\prec$ " BY " $\rightarrow$ "
11. p 58, line 18: REPLACE " $\prec$ " BY " $\rightarrow$ "
12. p 58, line 21: DELETE "of linear extensions"

13. p 58, line 30: REPLACE “ $\prec$ ” BY “ $\rightarrow$ ”
14. p 58, line 32: REPLACE “ $P_1$  and  $P_2$ ” BY “ $p_1$  and  $p_2$ ”
15. p 58, line 5 from bottom: REPLACE “introduced” BY ‘introduce”
16. p 58, line 4 from bottom: REPLACE “studies” BY “study”
17. p 59, Caption of Figure 3.3: REPLACE “ $\prec$ ” BY “ $\rightarrow$ ”
18. p 59, line 5: INSERT “the set of tuples in the linear extension” AFTER “ $\mathcal{L}_1$  be”
19. p 59, line 10: INSERT “the set of tuples in the linear extension” AFTER “ $\mathcal{L}_2$  be”
20. p 59, line 11 from bottom: REPLACE “ $(\mathcal{L}_1 \setminus P) \cap \mathcal{L}_2 = \emptyset$  and  $(\mathcal{L}_2 \setminus P) \cap \mathcal{L}_1 = \emptyset.$ ” BY “ $(\mathcal{L}_1 \setminus \mathcal{P}) \cap \mathcal{L}_2 = \emptyset$  and  $(\mathcal{L}_2 \setminus \mathcal{P}) \cap \mathcal{L}_1 = \emptyset.$ ”
21. p 60: Section 3.5.1, line 14: subscripts “ $vt_i$ ” should be “ $vt_j$ ” (two instances)
22. p 60: Section 3.5.1, line 16: REPLACE “worst of case” BY “worst case”
23. p 64, line 20: DELETE “by”
24. p 64, line 21: REPLACE “of fourth” BY “of the fourth”
25. p 65, first para: REPLACE “ $<$ ” BY “ $\langle$ ” (9 instances)
26. p 65, first para: REPLACE “ $>$ ” BY “ $\rangle$ ” (9 instances)
27. p 65, line 16: REPLACE “on fourth” BY “on the fourth”
28. p 66, line 19: delete “a”
29. p 66, line 27: add a missing closing “)” after “ $v_n$ ” and before “}”
30. p 68, **R1** bullet: REPLACE “an event (send, receive, or internal)” BY “a send or internal event”
31. p 69, Figure 3.7: For the  $P_k$  process line, the first label should be “ $mt_e[j, k]$ ” instead of “ $mt_e[i, k]$ ”
32. p 69, line 4 from bottom: REPLACE “occurred” BY “that occurred”
33. p 70, line 8 from bottom: REPLACE “at process” BY “at a process”
34. p 73, line 5: REPLACE “of next” BY “of the next”
35. p 76, line 15: REPLACE “r” BY “r”
36. p 79, 5 lines above Section 3.9.2: REPLACE “synchrinization” BY “synchronization”
37. p 80, last line: DELETE “Recall that”
38. p 83, line 19: REPLACE “aplications” BY “applications”

## Errata for Chapter 4

1. p 99, line 2 from bottom: REPLACE “*init\_snap, regular*” BY “*init\_snap, snap\_completed, regular*”
2. p 99, line 2 from bottom: REPLACE “*init\_snap*, and” BY “*init\_snap* and”
3. p 103, lines 1-2: ADD “{” BEFORE “white” (2 instances)  
ADD “}” AFTER “ $C_{ij}$ ” (2 instances)
4. p 103, line -4: REPLACE “<” BY “<”
5. p 103, line -3: REPLACE “>” BY “>”
6. p 104, line 2: REPLACE “<” BY “<” and REPLACE “>” BY “>”
7. p 107, Section 4.6.2, line 1: REPLACE “ $SENT_i[1, \dots, N]$  and  $RECD_i[1, \dots, N]$ ” BY “ $SENT_i[1, \dots, n]$  and  $RECD_i[1, \dots, n]$ ”
8. p 108, line 1: REPLACE “send” BY “*send*”
9. p 108, line 7 from bottom: REPLACE “send” BY “*send*”
10. p 108, last line: REPLACE “discused” BY “discussed”
11. p 110, Section 4.8, line 4: REPLACE “post martem” by “off-line”
12. p 110, line 7 from bottom: REPLACE “not” by “not the”
13. p 111, line 9: REPLACE “ $C_{i,j}$ ” BY “ $C_{i,x}$ ”
14. p 111, line 10: REPLACE “ $C_{x,y}$ ” BY “ $C_{j,y}$ ”
15. p 111, line 11: REPLACE “ $C_{i,j}$ ” BY “ $C_{i,x}$ ”  
REPLACE “ $C_{x,y}$ ” BY “ $C_{j,y}$ ”
16. p 112, Definition 4.1, item 2: REPLACE “ $1 \leq k \leq n$ ” BY “ $1 \leq k \leq n - 1$ ”
17. p 112, line 9 from bottom: REPLACE “sends  $m_6$  and receives  $m_5$  in different checkpoint intervals.” BY “sends  $m_6$  in an earlier checkpoint interval than the one in which it receives  $m_5$ .”
18. p 114, line 6: DELETE “to be”
19. p 114, line 7: REPLACE “in way” BY “in a way”
20. p 114, lines 8-9: MOVE “(including zigzag cycles)” TO AFTER “path” AND BEFORE “exists”
21. p 115, line 5: ADD space after “ $\rightsquigarrow$ ”
22. p 115, Corollary 4.2, line 2: REPLACE “ $N$ ” BY “ $n$ ” (2 instances)
23. p 116, line 4: REPLACE “always” BY “always a”

24. p 117, line 3 from bottom: REPLACE “ $N$ ” BY “ $n$ ”
25. p 118, line 5: DELETE “a set”
26. p 118, line 2 from bottom: REPLACE “ $T \cup C$ ” BY “ $T \cup \{C\}$ ”
27. p 119, line 2: REPLACE “ $T \cup C$ ” BY “ $T \cup \{C\}$ ”
28. p 121, line 3 from bottom: REPLACE “computation run.” BY “computation.”
29. p 124, ref [13]: REPLACE “distribted” BY “distributed”
30. p 124, ref [16]: DELETE the opening and closing single quotes.  
REPLACE “Global” BY “An introduction to global”
31. p 124, ref [25]: REPLACE “H.B. Robert and J. Xu, Netzer,” BY “H.B.R. Netzer and J. Xu,”
32. p 125, ref [33]: REPLACE “Yi-Min” BY “Y.-M.”
33. p 125, ref [34]: REPLACE “Yi-Min” BY “Y.-M.”

### **Errata for Chapter 5**

1. p 141, lines 2e,3b,4b: The “/” symbol should be “\”
2. p 144, lines 3c,4c: The “/” symbol should be “\”
3. p 147, lines 2c: The “/” symbol should be “\”
4. p 174: 3rd line from bottom: add missing full-stop after “ $n/2^k$ ”

### **Errata for Chapter 6**

1. p 196, line 15: REPLACE “ $\langle s^2, s^1, r^2, s^3, r^3, s^1 \rangle$ ” BY “ $\langle s^2, s^1, r^2, s^3, r^3, r^1 \rangle$ ”
2. p 200: 9th line from bottom: correct the spelling of “acknowledgement”
3. p 213, Figure 6.13, last line in table: “ $P_{2,6}$ ” should read “ $P_2, P_6$ ”
4. p 217, line 3a: “where  $Q_{e.tag} = x$ ” should be “where  $Q_{e.tag} = x$  and  $Q_{e.sender\_id} = j$ ”
5. p 219, Figure 6.14(b): “ $\max(7,9)=9$ ” should read as “ $\max(9,9)=9$ ”

### **Errata for Chapter 7**

1. p 243, Section 7.3.1, line 6: replace “before” by “after”.
2. p 244, **R2**: “ $B(x')$ ” should be “ $B(x')$ ”.
3. p 245, the last line: “trasit” should be “transit”.
4. p 247, lines -11 and -12: “ $N$ ” should be “ $n$ ”.
5. p 250, lines 6 and 7: “repeat” should be “Repeat”.
6. p 250, item 5 line 3: “its” should be “it”.
7. p 253: item 8 line 3 and item 9 line 1: “repeat” should be “Repeat”.
8. p 253, line 7: “ $O(N)$ ” should read “ $O(n)$ ” and “ $N$ ” should read “ $n$ ”.
9. p 253, line 16: delete ‘no’.
10. p 253, line 17: “ $O(N * M)$ ” should read “ $O(n * M)$ ”.
11. p 254, line 2: ‘section the’ should be ‘section. The’.
12. p 255, Section 7.6.2, line 5: “NTD” should read as “NDT”.
13. p 256: Algorithm 7.2, line 3: “do” should be “**do**”.
14. p 257, line 1: “terminate” should be “*terminate*”.
15. p 257, Section 7.6.3, lines 7: “*remove\_message*” should be “*remove\_entry* message”.
16. p 258, line -2 of the third paragraph: replace “belonging to  $DS_i^2$  or for messages” by “belonging to  $DS_i^2$  ... or for messages”.
17. p 258, line 2 of the fourth paragraph: replace “ $n_i$  and process  $P_i$ ” by “ $n_i$ . Process  $P_i$ ”.
18. p 258, line 3 of the fourth paragraph: replace “when it has received” by “when it receives”.
19. p 259, lines -3, -5, and -7: replace “ $C_\alpha$ ” by  $C_\alpha$ ”.
20. p 260, lines 15 and 17: replace “ $C_\alpha$ ” by  $C_\alpha$ ”.
21. p 260, line 2 of the second paragraph: replace “locally evaluable” by “local”.
22. p 260, line -6: replace “ $P_j$  arrives to  $P_i$ ” by “ $P_j$  arrives at  $P_i$ ”.
23. p 261, **S5**, 2nd line: delete “(\* Executed only by  $C_\alpha$  \*)”.
24. p 261, **S5**, 3rd line: replace “Wait until” by “**Wait until**”.
25. p 261, **S6**, 2nd line: replace “repeat” by “**repeat**”.
26. p 261, **S6**, 4th line: replace “td” by “*td*”.
27. p 261, **S6**, 5th line: replace “until td” by “**until** *td*”.

28. p 261, Section 7.7.5, first line: delete “a”.
29. p 261, **S6**., line 1: replace “ $C_a$ ” by  $C_\alpha$ ”.
30. p 262, lines 5 and 14: replace “ $C_a$ ” by  $C_\alpha$ ”.
31. p 262, lines 7: delete “ $ANE_i$ ” after “set”.
32. p 262, lines 7: replace “This” by “This set is denoted by  $ANE_i$  because it”.
33. p 262, line -3: replace “ $NE_i$ ” by “ $ANE_i$ ”
34. p 263, **S5**, 2nd line: replace “repeat” by “**repeat**”.
35. p 263, **S5**, 4th line: replace “ofS” by “of  $S$ ”.
36. p 263, **S5**, 7th line: replace “td” by “ $td$ ”.
37. p 263, **S5**, 8th line: replace “until td” by “**until**  $td$ ”.
38. p 263, **Performance**, lines 2-4: replace “Thus, its message complexity is  $4n$  which is lower than the static termination detection algorithm since no acknowledgements are necessary.” by “Since no acknowledgements are necessary, its message complexity is  $4n$ , which is lower than the static termination detection algorithm.”
39. p 265, 10th line: replace “vertical,” by “vertical”.
40. p 268, Algorithm 7.4, line (6): replace “closk” by “clock”.
41. p 268, Algorithm 7.4, line (10): replace “**endif**” by “**end if**” and align it with **if** on line (8).
42. p 268, Algorithm 7.4, lines (2), (b), (c), (11), and (14): replace “<” by “ $\langle$ ” and replace “>” by “ $\rangle$ ”.
43. p 268, the caption of Algorithm 7.4: insert “at  $P_j$ ” after “algorithm”.
44. p 269, Algorithm 7.5, line (c): replace “ $\leq$ ” by “ $\langle$ ” and replace “>” by “ $\rangle$ ”.
45. p 269, Algorithm 7.5, line (12): replace “<” by “ $\langle$ ” and replace “>” by “ $\rangle$ ”.
46. p 269, the caption of Algorithm 7.5: insert “at  $P_j$ ” after “algorithm”.
47. p 269, the first paragraph, line 2: replace “<” by “ $\langle$ ” and replace “>” by “ $\rangle$ ”.
48. p 269, line -6: replace “at later” by “at a later”.
49. p 270, line -8: delete comma after “echo”.
50. p 271, line 7: replace “{” by “/\*” and replace “}” by “\*/”.
51. p 271, Algorithm 7.6, lines (c), (4), (d), (14), and (20): replace “<” by “ $\langle$ ” and replace “>” by “ $\rangle$ ”.
52. p 272, third paragraph, line 2: replace “<” by “ $\langle$ ” and replace “>” by “ $\rangle$ ”.
53. p 273, second paragraph, line 1: replace “ $P_1, P_2, \dots, P_n$ ” by “ $\{P_1, P_2, \dots, P_n\}$ ”.

54. p 275, line 2: add “the” before “equation”.
55. p 275, first bullet: replace  $l_i$  by  $l_i$ .
56. p 275, third bullet: replace “systems” by “system’s”.
57. p 276, **A3**: replace “if” by “**if**”, “then” by “**then**”, and “end if” by “**end if**”.
58. p 276, the caption of Algorithm 7.7: insert “at  $P_i$ ” after “algorithm”.
59. p 277, **F2**, line 2: replace  $l_i$  by  $l_i$ .
60. p 277, **F3**, line 11: replace  $t_i$  by  $t_i$ .
61. p 277 and 278, **Algorithm 7.8**: replace “if” by “**if**”, “then” by “**then**”, “else” by “**else**”, and “end if” by “**end if**”.
62. p 278, the caption of Algorithm 7.8: insert “at  $P_i$ ” after “algorithm”.
63. p 278, line -4: delete “by”.
64. p 279, line 3: replace “remination” by “termination”.
65. p 279, Section 7.10, line -6: replace “algorithm” by “algorithms”.
66. p 279, Exercise 7.2, line 2: replace “processe” by “processes”.

## Errata for Chapter 8

## Errata for Chapter 9

1. p 306, Section 9.2.1, line 1: replace  $N$  by  $n$  and  $S_N$  by  $S_n$ .
2. p 306, Section 9.2.1, first para, line -3: replace “refereed” by “referred”.
3. p 306, Section 9.2.1, first para, line -2: insert “received” after “have”.
4. p 307, Second bullet, line 2: delete “and”.
5. p 309, Section 9.3, line 3: delete “a” and replace “request” by “requests”.
6. p 312, third para, line -2: replace “preserves” by “preserve”.
7. p 313, Algorithm 9.2, item (d), line 2: insert “ $S_i$ ” after “then”.
8. p 315, first para: replace “(2,1)” by “(1,1)”, replace all occurrence of  $S_2$  by  $S_1$ , and replace all occurrences of  $S_1$  by  $S_2$ .
9. p 317, line 4: replace  $S_i$  by  $\{S_i\}$ .
10. p 318, line 2: replace “=” by “:=”.

11. p 320, item 2, line 1: replace " $S_3$ " by " $S_3$ 's request".
12. p 321, Section 9.5.4, line -2: replace "a" by "in the".
13. p 321, Section 9.6, line 1: replace "Kshemakalyani" by "Kshemkalyani".
14. p 322, first para: replace all three occurrences of  $S_{i_n}$  by  $S_{i_j}$ .
15. p 322, first para, last line: replace  $n$  by  $j$ .
16. p 322, definition 9.2, line 2: replace  $CSet_i$  by  $CSet_i$ .
17. p 323, item 3, line 1: replace "requist" by "request".
18. p 323, para after item 3, line 4: replace "resuests" by "requests".
19. p 323, line -16: replace "another then  $P_0$ " by "another.  $P_0$ ".
20. p 325, first bullet, line 1: replace "are concurrent and they" by "make concurrent requests. They".
21. p 325, third bullet, lines 1 and 2: replace "and at the same time," by "just after".
22. p 325, item 1(a), line 1: replace  $CSet_i$  by  $CSet_i$ .
23. p 327, item 1, line 5: replace "algorithm" by "algorithms".
24. p 327, item 1, line 6: replace " $\Phi$ " by " $\phi$ ".
25. p 327, item 2, line 1: replace "algorithm" by "algorithms".
26. p 331, third bullet, line 2: replace "appropriate" by "an appropriate".
27. p 331, third bullet, line 3: replace "REPLY ( $j$ )" by "REPLY( $j$ )".
28. p 331, third bullet, line 3: replace "top request's site in" by "site whose request is at the top of"
29. p 331, Section 9.9, line 3: insert "the" before "hierarchical".
30. p 333, item 1: replace "{ sites" by "{sites".
31. p 335, line 1: replace "gurantees" by "guarantees".
32. p 335, item 6, line 3: replace "and waits" by "and the site waits".
33. p 337, item 1, line 4: replace "determined" by "determine".
34. p 337, item 1, line -2: insert "be" after "should".
35. p 337, item 1, line -1: replace "outdateded" by "outdated".
36. p 337, para after item 2: replace seven occurrences of " $n$ " by " $sn$ ".
37. p 337, para after item 2, line 4: replace " $n$ th" by " $sn$ th".
38. p 337, para after item 2, line 5: replace " $N$ " by " $n$ ".



39. p 337, last para, lines 3 and 6: replace “ $N$ ” by “ $n$ ”.
40. p 341, Figure 9.19: Change the caption to the following: “Tree with logically directed edges when node B holds the privilege.”.
41. p 341, Figure 9.19: The edge from B to C should be from C to B and the edge from C to G should be from G to C.
42. p 349, Section 9.15, third line: insert “the” before “last”.
43. p 349, Section 9.15, second para, first line: insert “a” before “unique”.
44. p 350, item [4], line 2: replace “technical” by “Technical”.
45. p 351, item [30], line 1: replace “Vas” by “Von”.

### **Errata for Chapter 10**

1. p 353, Sec 10.2.1, line 1: ADD “a” BEFORE “directed”
2. p 353, Sec 10.2.1, line 3: REPLACE “mode” BY “node”
3. p 354, line 4: INSERT “the” AFTER “In”
4. p 357, line 10: REPLACE “process is” BY “processes in”
5. p 357, line 14: REPLACE “ $P$  is” BY “in”
6. p 357, line 23: REPLACE “in an OR” BY “in the OR”
7. p 357, last line: REPLACE “ $k$ ” BY “ $p$ ”
8. p 358, line 1: REPLACE “ $n$ ” BY “ $q$ ”
9. p 358, line 5: In the math expression, INTERCHANGE the positions of  $p$  and 1 so that 1 is above and  $p$  is below.
10. p 359, line 4: REPLACE “different to” BY “different from”
11. p 362, line 1: REPLACE “will prove” BY “have”
12. p 363, line 1: REPLACE “except the” BY “except”
13. p 363, Algorithm 10.1, step (f): REPLACE “requests  $P_j$ ” BY “requests by  $P_j$ ”
14. p 370, lines 16-17-18: DELETE “/\*  $1/|out(i)|$  is the fraction of weight sent in a FLOOD message \*/”  
DELETE the blank lines 17 and 18
15. p 370, lines 20-21: between these two lines, INSERT a new line with the left-justified text: “[”  
It should look like line 8 on page 371

16. p 371, lines 5-6: between these two lines, INSERT a new line with the left-justified text: "]"  
It should look like the second-last line on this page
17. p 372, Figure 10.4 caption: REPLACE "reached" BY "reduced"
18. p 375, line 6: REPLACE "through) through" BY ") through"
19. p 375, last line: DELETE "a"
20. p 377, ref [19]: REPLACE "computersystems" BY "computer systems"
21. p 377, ref [21], line 2: REPLACE ";" BY "·"
22. p 377, ref [23], line 3: REPLACE "simulation" BY "Simulation"

### **Errata for Chapter 11**

### **Errata for Chapter 12**

1. p 415, line 10 from bottom: REPLACE " $Write(x, 2)$ " BY " $Write(y, 2)$ "
2. p 418, line 19: REPLACE " $Write(x, 2)$ " BY " $Write(y, 2)$ "
3. p 433: Algorithm 12.9, line (3f): replace " $waiting[j]$ " by " $waiting[next]$ "
4. p 440: line -6: replace "out" by " $R_{val}$  location and zeros out the"
5. p 440, lines -5 and -4: DELETE " $R_{val}$  location and then zeros"

### **Errata for Chapter 13**

1. p 457, Section 13.2.1, line 1: replace " $P_1, P_2, \dots, P_N,$ " by " $P_1, P_2, \dots, P_N,$ ".
2. p 458, line -2: insert "if" after "which".
3. p 459, line 5: insert "for" after "which".
4. p 460, Section 13.2.5, line 5: insert "of" after "types".
5. p 466, line 4: replace "can" by "could".
6. p 472, Section 13.5.2., line 7: delete "a".
7. p 480, Section 13.7.2, line 3: replace " $m.sender$ " by " $m.sender$ ".
8. p 480, Section 13.7.2, line 4: replace " $msqs\_sent$ " by " $msgs\_sent$ ".

9. p 481, fourth para, line 4: insert “to” after “back”.
10. p 481, fourth para, line 7: insert “the” after “in”.
11. p 482, Figure 13.14: Change the caption to the following: **Figure 13.14:** An example execution of the Juang-Venkatesan algorithm.
12. p 483, second bullet: replace “Uses” by “uses”.
13. p 483, third bullet, line 1: insert “a” before “consistent”.
14. p 483, third bullet, line 2: replace “a recovery” by “recovery”.
15. p 486, Section 13.8.2, line 13: replace “variable” by “variables” and “is” by “are”.
16. p 487, *Checkpointing algorithm*., line 15: replace “if” by “If”.
17. p 488, line -5: replace “its” by “their” and “checkpoint” by “checkpoints”.
18. p 489, line -8: delete “if”.
19. p 490, second para, line 4: insert “were” after “and”.
20. p 492, fourth bullet: delete “the” before “both”.
21. p 492, fifth bullet: replace “easeness” by “ease”.
22. p 493: add the following item after the fifth bullet:
  - $e_i^j \mapsto e_i^l$  iff  $e_i^j \rightarrow e_i^l \wedge \exists$  such that  $e_i^j \rightarrow e_i^k \rightarrow e_i^l$  where  $e_i^j$  and  $e_i^l$  are in the same process,  $p_i$ .
23. p 494, fourth para, line 2: replace “ $rb^k_j$ ” by “ $rb^k_j$ ”.
24. p 498, first line after equ. (13.2): replace “exist” by “exists”.
25. p 498, **Theorem 13.2 Proof**, first line: replace “s” by “s”.
26. p 499, line 11: replace “If  $n(s)$ ” by “If  $n(s)$ ” and  
replace “ $n(s)$ then  $\neg$ Orphan( $s, f_i^m$ )” by “ $n(s)$  then  $\neg$ Orphan( $s, f_i^m$ )”
27. p 499, last line: delete “It is based on ..... Netzer and Xu [27]”.
28. p 500, line 2: replace “Netzer and Xu” by “Netzer and Xu [27]”.
29. p 501, item 2, line 3: replace “13.18(b)),.” by “13.18(b)).” and replace “ $m_1,$ ” by “ $m_1,$ ”.
30. p 501, line 20: insert “that of” after “than”.
31. p 501, line -11: replace “where  $P$ ” by “where  $P$ ”.
32. p 502, item 2, line 5: replace “corresponds” by “correspond”.
33. p 503, first bullet, line 1: replace “process a” by “a process”.
34. p 503, second bullet, line 1: delete “to”.

35. p 505, **Theorem 13.5 Proof**, line 4: replace “implications” by “implication”.
36. p 505, Section 13.11: merge the last three paragraphs on this page starting with “There are three...”, “In uncoordinated ...”, and “In coordinated ...”.
37. p 506, Exercise 13.2, line 2: insert “the” before “global”.
38. p 506, Section 13.13, line 6: insert “et al.” after “Elnozahy”.
39. p 507, line 9: replace “paper” by “papers”.
40. p 507, **References**: replace item [2] with the following:  
     [2] Roberto Baldoni, Jean-Michel Helary and Michel Raynal, Consistent records in asynchronous computations, Acta Infomatica, Vol 35, No 6, June 1998, pp. 441-455.
41. p 507, **References**, item [10], line 2: replace “Computing” by “on Computers”.
42. p 508, item [29], line 2: insert “and” after “Parallel”.
43. p 509, item [35], line 2: replace “annual” by “Annual”.
44. p 509, item [36], line 1: replace “systems” by “systems,”.

#### **Errata for Chapter 14**

1. p 553, line 28: replace “operation  $Z$ ” by “object  $Z$ ”

#### **Errata for Chapter 15**

1. p 567, second para, line 7: insert “,” after “messages” and replace “casued” by “caused”.
2. p 567, third para, line 1: insert “a” before “distributed”.
3. p 567, third para, line 2: insert “the” before “asynchronous”.
4. p 569, first para, line -2: delete “execution”.
5. p 569, third para, lines 3 and 4: replace “A failure detector history  $H$  with range  $R$  is a fuction  $H$  from  $\Omega X\Phi$  to  $R$ .” by “A failure detector history  $H$  is a function from  $QX\Phi$  to  $2^Q$ .”.
6. p 570, Section 15.2.3, line 4: replace “resticts” by “restricts” and “suspect” by “suspects”.
7. p 570, first bullet, line 3: replace “*such that*” by “such that”.
8. p 570, second bullet, line 3: replace “*such that*” by “such that”.

9. p 571, **Definition 15.2**: change from italics to regular.
10. p 571, **Definition 15.3**: change from italics to regular.
11. p 572, Section 15.2.5, line 2: insert " $T_{D \rightarrow D'}$ " after "algorithm".
12. p 572, Section 15.2.5, line 4: insert the following after " $D'?$ ": "Algorithm  $T_{D \rightarrow D'}$  requires  $D'$  to maintain a variable  $output_p$  at every process  $p$ . This variable is a part of the local state of  $p$  and emulates the output of  $D'$  at  $p$ ."
13. p 573, line 2-3: delete the following sentence: "That is, variable  $output_p$  at process  $p$  emulates the output of  $D'$ ."
14. p 573, line 18-19: replace " $T_{D \rightarrow E}$ " to " $T_{D' \rightarrow E}$ ".
15. p 573, line 19: replace " $D \in D$ " by " $D' \in D$ ".
16. p 574, **Algorithm 15.1**, line 7: replace "for" by "from".
17. p 575, **Lemma 15.3**, line 3: replace " $output_R$ " by " $output^R$ ".
18. p 575, line -2: replace "p" by " $p$ ".
19. p 576, **Algorithm 15.2**, Task 2, line 2: replace "k" by " $k$ ".
20. p 579, **Algorithm 15.3**, lines 3 and 11: replace "<" by "<" and ">" by ">"
21. p 580, Section 15.3.3, line 3: replace "satisfies the" by "satisfies".
22. p 580, Section 15.3.3, second para, line 1: insert "problem" after "consensus".
23. p 581, **Algorithm 15.4**, Phase 4, line 3: replace "broadcatss" by "broadcasts".
24. p 581, **Algorithm 15.4**, Task 2, line 5: replace "decided" by "*decided*".
25. p 582, first bullet, line 1: replace "p" by " $p$ ".
26. p 584, Section 15.5, line 2: insert "the" before "atomic" and insert "problem" after "consensus".
27. p 585, caption of **Algorithm 15.5**: replace "Solution" by "solution".
28. p 587, line 7: replace "detector" by "detectors".
29. p 587, line 8: replace "property:" by "property: (An environment  $E$  is a set of all possible failure patterns and  $\Omega$  denotes the set of all the processes.)".
30. p 589, Section 15.7, line 1: replace "fetector" by "detector".
31. p 592, Section 15.8.1, first para, line -3: insert "a" before "communication statement".
32. p 594, **Algorithm 15.7**, line 11: replace "-" by "-".
33. p 594, line -8: replace "when" by "When".
34. p 595, line 5: replace "ping" by "*ping*".

35. p 595, line -8: replace “atmost” by “at most”.
36. p 595, line -3: replace “ping(m)” by “*ping(m)*” and replace “ $\Phi$ ” by “ $\phi$ ”.
37. p 596, Section 15.10, second para, line 5: delete “the” before “consensus”.
38. p 596, Section 15.10, second para, line 6: replace “present” by “presents”.
39. p 597, reference [11]: insert “Proceedings of Foundations of Software Technology and Theoretical Computer Science, 18th Conference, Chennai, India, December 17-19, 1998, ” before “Berlin/Heidelberg”.

### Errata for Chapter 16

1. p 604, line -10: replace “message  $m$ ” by “message  $m'$ ”.
2. p 607, line -5: replace “client” by “client.”.
3. p 608, line 5: replace “16.5” by “Algorithm 16.5”.
4. p 609, line 6: replace “ $p_{t+1}=SK \oplus (SK \oplus p_{t+1})$ ” by “ $p_{t+1}=SK \oplus (SK \oplus p_{t+1})$ ”.
5. p 609, line 8: replace “ $N:=$ ” by “ $N=$ ”.
6. p 610, the para after **Algorithm 16.7**, line 11: replace “ $(N_A, M, A, B)_{K_{AS}}$  and  $(N_B, M, A, B)_{K_{BS}}$ ” by “ $(N_A, K_{AB})_{K_{AS}}, (N_B, K_{AB})_{K_{BS}}$ ”.
7. p 612, Caption of **Algorithm 16.8**: replace “Authentication” by “authentication” and “Login” by “login”.
8. p 613, second para, line 2: replace “ $K'_U$ ” by “ $k'_U$ ”.
9. p 616, line -7: replace “message  $m$ ,” by “message  $m$ ”.
10. p 625, the first line after **Algorithm 16.16**: replace “are messages” by “messages are”.
11. p 626, Section 16.7, line 2: insert “the” before “other”.
12. p 627, Exercise 16.5, last line: replace “problem?” by “problem.”.
13. p 628, line 9: replace “[3,9,12]–[14,19,27,38,40,42,43]” by “[3,9,12–14,19,27,38,40,42,43]”.
14. p 629, reference [23]: replace “1992” by “(10):265–310, November 1992”.

### Errata for Chapter 17

1. p 631, line 8: replace “instantaneoulsy” by “instantaneously”.
2. p 632, Section 17.2, line 1: insert “a” before “set of computers”.

3. p 632, Section 17.2, line 2: insert “a” before “network”.
4. p 633, line 6: replace “computer” by “computers”.
5. p 635, line 14: delete “that” before “relevant”.
6. p 635, *Transient failure*, line 3: replace “chennels” by “channels”.
7. p 635, Section 17.3.1, line 5: insert “a” before “*randomized*”.
8. p 636, line 7: replace “ $\lim_{k \rightarrow \infty} f(k) = 0$ ” by “ $\lim_{k \rightarrow \infty} f(k) = 0$ ”
9. p 638, line 11: replace “ $r \in K$ ” by “ $r \in K$ ”.
10. p 644, second para, line -3: replace “only is” by “only if”.
11. p 647, line 5: replace “ $-d$ ” by “ $d$ ”.
12. p 647, Section 17.5.1, line 3: replace “component” by “components”.
13. p 648, **Topology-based primitives**, line 3: insert “distributed” before “reset”.
14. p 648, the last line: replace “The algorithms” by “The algorithm”.
15. p 651, line -5: replace “the the” by “the”.
16. p 653, **Algorithm 17.2**, line 2: replace “Number” by “number”.
17. p 653, **Algorithm 17.2**, line 5: replace “the” by “= the”.
18. p 653, **Algorithm 17.2**: replace three occurrences of “<” by “<” and replace three occurrences of “>” by “>”.
19. p 653, line -5: replace “<” by “<” and “>” by “>”.
20. p 655, Section 17.8.2, lines 7: replace “Dolev *et al.*” by “Dolev,”.
21. p 655, line -10: replace “store” by “stored”.
22. p 656, line -2: delete “called”.
23. p 657, Section 17.9: insert the following at the end of the first para:  
“*A 1-maximal independent set is a maximal independent set provided one cannot increase the cardinality of the independent set by removing one node and adding more nodes.*”
24. p 661, line -1: replace “Leader” by “leader”.
25. p 662, line 5: replace “ $m \varepsilon A$ ” by “ $m \in A$ ”.
26. p 662, first bullet, line 1: replace “termination it’s” by “termination, it is”.
27. p 662, line -2 before Section 17.11.1: replace “sequesntial” by “sequential”.
28. p 663, line -4 before Section 17.11.2: insert “is” before “not”.
29. p 664, line 3: replace “predicate.” by “predicate”.

30. p 664, footnote: replace “legitimate” by “legitimate.”.
31. p 671, Section 17.17, line -6: replace “Antonioiy” by “Antonioiu”.
32. p 671, Reference [1], line 1: replace “Gouda” by “Gouda,”.
33. p 671, Reference [1], line 2: replace “1992.” by “Taiwan, 1992, 90-96.”.
34. p 673, Reference [32], line 1: replace “J.-M., Couvreur and M.G. Gouda” by “J.-M., Couvreur, N. Francez, and M.G. Gouda”.
35. p 673, Reference [32], line 3: replace “1992.” by “1992, 486-493.”.
36. p 674 Reference [45], line 2: replace “SRDS 2002” by “*Proc. of the*”.
37. p 675 Reference [67], line 2: replace “Seminor” by “Seminar”.
38. p 675 Reference [68], line 2: replace “2002 available” by “2002, Available”.

### **Errata for Chapter 18**

1. p 682, 2nd line: correct spelling of “acutal” is “actual”
2. p 692, line (4b): replace “[ $j, i$ ]” by “(*predecessor, j*)”
3. p 708: REPLACE “prsoners” BY “prisoners”