Errata for the Fourth Printing

Nancy Lynch

Note: Page and line numbers below are in the fourth printing.

p. xvi:
Chapter 23 title should be “Modeling V: Partially Synchronous System Models”.

p. 35, line 8:
"are left as an exercise (Exercise 3.6)".

p. 48:
After Exercise 3.5, add a new exercise:
“Prove that the total time complexity of the HS algorithm is at most 3n if n is a power of 2, and 5n otherwise.”

p. 61, line 19:
"time is $O(\text{diam})$, the number of messages is $O(\text{diam}|E|)$, and the number of bits is $O(n|E|b)$.

p. 111, line 3:
“it must be that $i_k$ does not send a message...”

p. 154:
After Exercise 6.5, add a new exercise:
“If the FloodSet algorithm is run for only $f$ rounds instead of $f + 1$, then what is the largest number of different decisions that can be reached by nonfaulty processes?”

p. 155:
After Exercise 6.13, add a new exercise:
“If the EIGStop algorithm is run for only $f$ rounds instead of $f + 1$, then what is the largest number of different decisions that can be reached by nonfaulty processes?”

p. 234:
After Exercise 8.16, add a new exercise:
“Consider a channel $D$, which is similar to channel $C$ on p. 204, except that it allows internal message duplication.

More specifically, in addition to the send and receive actions, $D$ has two internal actions, duplicate and discard. When a send($m$) occurs, the message $m$ is added to the end of the queue along with a Boolean tag. Tags for successive messages that are sent alternate, 1, 0, 1, 0,.... A duplicate causes an arbitrary message in the queue to be duplicated in place, along with its tag. The channel also keeps track of the tag of the last message delivered. A receive delivers the first message on the queue, as before, but only if the tag is unequal to that of the last message delivered. A discard discards the first message on the queue, provided the tag is the same as that of the last message delivered.
(a) Give formal code for automaton $D$, in the same style as the other code in this chapter.
(b) Prove carefully that $D$ implements $C$, in the sense of inclusion of sets of traces. Use a simulation relation.

p. 286:
The precondition for set-flag$_i$ should use = instead of :=.

p. 330:
After Exercise 10.23, add a new exercise:
“Prove that the Bakery algorithm guarantees bounded bypass.”

p. 425, line 6:
“returned by the second of these two sets of reads (which...”

p. 425, line 7:
“by the first of the two sets of reads”
What follows now is a collection of changes that would have to be made all together, for consistency. This change would simplify some arguments. The new observation is that we can omit Condition 1 in the statement of Lemma 16. It is implied by Condition 2, because $\beta$ is a sequence.

p. 434, line -1:
Replace “four” by “three”.

p. 435, line 1:
Replace “four” by “three”.

p. 435, Lemma 13.16:
Remove the first condition and renumber the others.
After the Lemma, remove the first sentence, explaining Condition 1, and renumber the mentions of Conditions 2, 3, and 4 in the rest of this paragraph as 1, 2, and 3.
Modify the proof to begin with:
“We begin by claiming that for any operation $\pi$ in $\Pi$, there are only finitely many operations $\phi$ such that $\phi < \pi$. This is because, if there were infinitely many such operations $\phi$, then by Condition 1, all of their invocation events would have to precede the response event of $\beta$. (The fact that $\beta$ contains no incomplete operations implies that such a response event does in fact appear in $\beta$.) But $\beta$ is a sequence, so no element can have infinitely many predecessors, a contradiction.
Now we describe how to insert a serialization ....”

p. 435, line -6:
Instead of “Condition 1 implies”, say “The claim at the beginning of this proof implies”.

p. 436, line 13:
Condition 1

p. 436, line 18:
Condition 2
p. 436, line 19: Condition 3

p. 439, line 14: Replace “four” with “three”.

p. 439: Remove the entire proof numbered 1, which spans from line 16 to line -7 on the page. Re-number the remaining three parts as 1, 2 and 3 instead of 2, 3 and 4.

p. 443, line -3: Replace “four” with “three”.

p. 443, line -2 and -1: “Conditions 2 and 3 are immediate, so all we must show is Condition 1. For this, the following...”

p. 444, line -15 and -14: Omit the tiny paragraph “Using Claims 13.24 and...an exercise”

p. 453: Omit Exercise 13.27.

p. 444, line 13: Replace “For Condition 2,” with “To show Condition 1,”

p. 580, line 1: Replace “four” with “three”.

This is the end of coordinated set of changes.

p. 700, lines -1 and -2: Four instances of $\alpha$ should be $\alpha'$.

p. 731: After Exercise 22.13, add a new exercise: “Prove that the Probe protocol is not message bounded. Do this by showing, for each $k$, how to produce a complete execution $\alpha$ that has no $k$-extensions.”

p. 736, line -12: Replace “lower” with “lower(C)”.