

Identified errors in the slides, book, and articles for RTA

June 28th, 2006

In this note, a list of identified errors in the slides, book and articles used for real-time architectures (RTA, course 2IN20) is maintained.

Slides

- slide 11 of RTA.B5-Analysis-2 contained two errors in the same item:
 - instead of “ $U_{j-1} \leq 1$ ” the item should contain “ $\sum_{j < i} U_{j-1} < 1$ ”, i.e. whenever the tasks with a higher priority than τ_i do not need all CPU cycles, there will ultimately be enough time for τ_i to complete its first job. This problem has been resolved in the version dated 05-06-2006.
- slide 11 and 21 of RTA.B5-Analysis-2 contained similar errors:
 - the “ i ” and “ j ” have been exchanged below the summation sign for $WR_i^{(k+1)}$ on slide 11 and for $BR_i^{(k+1)}$ for slide 21, i.e. it should be “ $j < i$ ” rather than “ $i < j$ ”. This problem has been resolved in the version dated 27-06-2006.

Book

- On page 41, below the header “PRECEDENCE CONSTRAINTS WEAKENED” there is a typo: rather than removing the precedence relations between task J_4 and tasks J_5 and J_6 , these precedence relations are kept (and those between task J_4 and tasks J_7 and J_8 are removed).
- The solution to exercise 3.4 (p. 376) contains two errors:
 - Based on the heuristic function $H = a + C + D$, the schedule found is $\{J_2, J_4, J_3, J_1\}$ (rather than $\{J_2, J_3, J_4, J_1\}$, as mentioned in the book).
 - As illustrated in Figure 12.2, there is only one feasible schedule, i.e. $\{J_3, J_2, J_4, J_1\}$. This schedule can be found by using, for example, the heuristic function $H = a + d = 2a + D$. Unlike what is mentioned in the book, the feasible schedule is not found for $H = a + D$.
- The example on p. 98 – 100 contains a number of errors.
 - The iteration steps to determine R_4 on p. 100 do not conform to the description of the calculation of R_i on p. 98. This problem finds its cause in a partial update from the 1st towards the 2nd edition, i.e. the calculation has been updated, but the iterative steps to determine R_4 has remained unaltered. Please note that the final result found for R_4 is correct.
 - The value for $I_4^{(3)}$ is 8 (rather than 7, as given in the book).
 - Without additional explanation (e.g. the terms f_4^k), Figure 4.14 is considered to be unclear.
 - The term f_4^k is probably meant to be equal to $I_4^{(k)} + C_4$.
 - The figure is probably meant to show I_4 as a function of t , i.e. $I_4(t) = \sum_{j < i} \lceil t/T_j \rceil$. Strictly spoken, this is a function, and the

vertical lines should therefore not be there. Further note that for $t = 0$, we find $I_4(0) = 0$. Moreover, $I_4(t) = 4$ for $t \in (0, 4]$.