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Sommersemester 2013

Real-Time Systems

http://swt.informatik.uni-freiburg.de/teaching/SS2013/rtsys

Exercise Sheet 6

Early submission: Tuesday, 2013-07-16, 10:00 Regular submission: Wednesday, 2013-07-17, 10:00

Exercise 1: Extended Timed Automata (5/20 Points)

With Extended Timed Automata, we introduced committed locations.

- Explain in your own words, possibly using examples (different from the one in the lecture) the difference between urgent and committed locations. (3)
- We explained urgent locations by a syntactical transformation, urgent locations are thus not part of a Extended Timed Automaton tuple. Committed locations are. Could we also explain committed locations by a syntactical transformation? In other words: do committed locations add expressive power to Pure Timed Automata? (2)

Exercise 2: Timed Automata vs. Timed Büchi Automata (10/20 Points)

In the lecture, we claimed that Pure TA and TBA are "more or less" the same.

- Give a TBA whose language is the set of computations paths of the desktop lamp controller. (4)
- Give a TA whose set of computation paths is equal to the language of the "a/b" TBA example from the lecture. (4)
- Conclude — are they the same? If not exactly the same (why not?), then in what aspects are they equivalent? (2)

Exercise 3: Observer (5/20 Points)

Consider Exercise 2 of Exercise Sheet 2 (requirements for traffic lights).
Which of those requirements is testable, which one is not? If yes, give a test automaton (observer, monitor), if not, explain why not. In the negative cases, could TBA help? (5)