Assignment 5: Efficient feasibility test for FPPS

Fixed priority scheduling is *de-facto* standard and widely used today for scheduling tasks in industry and exact feasibility analysis is needed that is not complex and provides necessary and sufficient schedulability conditions for the periodic system. The exact feasibility analysis explained in [1] by Bini et al. comes up as a faster solution than the existing worst-case response time analysis methods. However, in many cases such as jitter analysis [2] and hierarchical systems’ analysis [3], worst case response times are also needed. The aim of the assignment is to study the key reference [1] that presents a fast and efficient schedulability (feasibility) analysis approach for uni-processor fixed-priority periodic tasks and a derived schedulability test based on this approach. The main topics to be addressed are as followings:

- summary of how the approach in [4] is modified and how the new approach is used to define feasibility region (supplemented with a non-trivial, detailed example of the exact analysis consisting of at least four tasks),
- discussion on the reasons that make the approach fast and efficient,
- how the workload \( W_i(b) \) approach is used to derive the necessary and sufficient test (supplemented with an example),
- discussion on whether or not it is possible to extend the analysis with activation jitter.

You are expected to give a 25 minutes presentation (including time for questions).

References


Further information

In case you have any questions concerning this assignment, please contact:

Ugur Keskin
E-mail: u.keskin@tue.nl