

Exercise F – Real-Time Architectures

In Chapter 4 *Periodic task scheduling* of [1], all overheads in the kernel are assumed to be zero. Hence, the cost of context switching and task scheduling are assumed to be zero. Similarly, the additional cost of context switching and budget scheduling for hierarchical scheduling are typically assumed to be zero. For this assignment, we want you to study the literature, to investigate the approaches that have been proposed to incorporate these costs in the recursive equations for worst-case response time analysis of real-time tasks under fixed-priority pre-emptive scheduling (FPPS) and under two-level hierarchical FPPS, and to summarize your findings in a report. The report must at least include:

- *how* these costs are incorporated in the analysis
 - for context switching and task scheduling under FPPS;
 - for context switching, task scheduling, and budget scheduling under two-level hierarchical FPPS.
- *why* these costs has been incorporated in that particular way, i.e. the *justification* for the approaches;
- your opinion about the approaches, i.e. [in-] appropriate, overly pessimistic, etc.;
- references to appropriate articles.

Reference

- [1] G.C. Buttazzo, “Hard real-time computing systems, predictable scheduling – algorithms and applications”, Springer, 2004, ISBN 0-387-23137-4 (2nd edition).