Erratum to
Schedulability and Optimization Analysis for Non-Preemptive Static Priority Scheduling Based on Task Utilization and Blocking Factors

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***Abstract*—We would like to thank Prof. Giorgio Buttazzo and Prof. Marko Bertogna for their questions, "Do you have an intuition to explain the interesting results?" during the conference with regard to Theorem 9. Our answer during the conference was "No, but the math provides such results." After the conference, we tried to get an intuition, and found a mistake in the proof procedure of Theorem 8. The mistake invalidates our original utilization bounds in Theorem 8 and Theorem 9. The correct procedure is now provided in the revised version.**

Mistake in the paper: In the proof of Theorem 8 in the appendix, the second equality in the following procedure is incorrect:

$$
\begin{aligned}
2 &= \left(\frac{\gamma U_k}{1-U_k}+1\right)(U_1+1)^{k-1} \\
&= \gamma\left(\frac{U_k}{1-U_k}+\frac{1}{\gamma}\right)\left(\frac{\gamma U_k+1-U_k}{\gamma(1-U_k)}\right)^{k-1} \\
&= \gamma\left(\frac{U_k}{1-U_k}+\frac{1}{\gamma}\right)^{k}
\end{aligned}
$$

This invalidates the derived utilization bound.

How to fix it: We solve the mathematical problem by showing that one of the boundary conditions $U_1 = 0$ or $U_1 = (2^{\frac{1}{k-1}} - 1)$ is the minimum. Therefore,

Theorem 8. *Suppose that the tasks are indexed such that $T_i \leq T_{i+1}$. If $\gamma = \max_{\tau_i \in lp(\tau_k)} \left\{\frac{C_i}{C_k}\right\} = \frac{B_k}{C_k} > 0$, then task τ_k is schedulable by RM-NP if*

$$\sum_{i=1}^{k} U_i \leq \min\left\{k(2^{\frac{1}{k}}-1), \frac{1}{1+\gamma}\right\}$$

Theorem 9. *Suppose that $\gamma = \max_{\tau_k}\left\{\max_{\tau_i \in lp(\tau_k)}\left\{\frac{C_i}{C_k}\right\}\right\}$. A task set can be feasibly scheduled by RM-NP if*

$$U_{sum} \leq \begin{cases} ln(2) \approx 0.693 & \text{if } \gamma \leq \frac{1-ln(2)}{ln(2)} \\ \frac{1}{1+\gamma} & \text{if } \gamma > \frac{1-ln(2)}{ln(2)} \end{cases}$$

Our action: We have filed a revision of the paper in our website. The corresponding arguments related to Theorems 8 and 9 are revised, including Figure 1. The revised version can be downloaded from http://ls12-www.cs.tu-dortmund.de/daes/en/daes/mitarbeiter/dipl-inf-georg-von-der-brueggen/publikationen.html