



November 8, 2010

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Editor-in-Chief  
Professor Dr. Manu Malek

Dear Prof. Malek,

Thank you very much for the review of the manuscript **Periodic Timers Revisited: the Real-time Embedded System Perspective**. A revised version that incorporates all your remarks and also the reviewers' suggestions is being submitted online. Graphical abstract and research highlights have been added. The addressing of reviewers' comments is discussed below:

- **Precise description of periodic and single-shot mechanisms**

We have extended the explanation about periodic and single-shot timers in the introduction and we also included a figure to depict the described example.

- **Paper's motivation and results**

We made both motivation and results clearer in the introduction. Our main purpose is to weave some of the prejudice against periodic timers, which actually owe much of their bad reputation to poor implementations. Besides, we present concrete information about the limitations of single-shot timers that might be specially useful for those endeavoring new real-time support systems.

- **Improving related work section**

We have fully rewritten the related work section, including additional timing solutions from other groups and describing each one in more detail. Well-known Real-Time Operating Systems (e.g. VxWorks, QNX, RTAI, RTLinux) are now featured.

- **Motivation for EPOS**

As we stated in the final remarks of Section 4, a smart implementation of a time management mechanism does not depend on the real-time operating system. We used EPOS in our experiments because it features an elegant and clean implementation that makes additions and extensions rather easier than for traditional, non component-based systems. An open-source version of EPOS is available online at <http://epos.lisha.ufsc.br>.

- **Conclusions**

We clearly cited the case where a periodic timer outperforms an equivalent single-shot timer (when requested periods exceed the maximum hardware period) and also explained why this happens (overhead of reprogramming the hardware timer and software tick counting). Indeed, we added the result of the multi-threaded environment experiment, in which the periodic interrupt handler presented better execution timer up to 5 threads in comparison to the single-shot interrupt handler.

- **Figures placement**

We made a complete review in the figures placement. We also changed the footnote on page 2 by a Figure as recommended by the reviewer #2.

- **Tables 1 and 2**

We changed the word targeted by expected in Tables 1 and 2 in order to improve the comprehension.

- **Abbreviations**

We have added a reference when AVR is used by the first time. AVR is not an abbreviation, but the name that Atmel gave for its architecture. We also made a review to spell out each acronym in the first time it is used.

Looking forward to have the manuscript published,

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Antônio Augusto Fröhlich