Topic E1 Reviews

from Oct-24-2011 20:05 CEST

(ordered by submission id)

No reviews available

Submission #0056 Overall Value: 2 Expertise: medium Reviewed As: REGULAR

General Information

Submission Id: 0056
Submission Title: **Length-based Contention Management: Increasing Schedulability of Real-Time Software with STM Concurrency Control**

Reviewer: 312285232
Reviewer's expertise: medium

Submitted as: regular paper/presentation

Form A (for programme committee only)

Ratings: n.a. not applicable 1 extremely poor, grossly substandard 2 poor, substandard
3 average, standard 4 good, above standard 5 outstanding, way above standard

Overall Value: 2

Best Paper Award Candidate: no

Comments for the committee:

Form B (returned to authors)

In conference scope? yes
Interactive presentation (IP) candidate? no
Paper exceeds 6 pages? no

Presentation (n.a. = not applicable, 1 = extremely poor, 5 = outstanding):
Accuracy of title: 4
Clarity of abstract: 4
Problem clearly defined: 3

Methods, algorithms, and proofs clearly described: 3
Experiments and results clearly described: 2
Clarity of tables and figures: 2
Overall Presentation (maybe different from average): 2

Content (n.a. = not applicable, 1 = extremely poor, 5 = outstanding):
Novelty of solution: 3
Thoroughness and depth of theory: 3
Hardness of experimental evidence: 1
Account of prior work (references): 3
Overall Content (maybe different from average): 2

Comments for the author:

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          The paper describes a mechanism for contention management in software
transactional memory, which not only considers the relative
priority/urgency of the conflicting transactions, but also the
percentage of execution of the transaction that is going to be
aborted, i.e., let a lower priority/urgency transaction finish till
commit if this results in a small delay. Also, the paper describes how
to perform schedulability analysis based on the computation of the
worst-case interferences among transactions.

The paper presents an interesting piece of work, but its comprehension
is hindered by a major exposition problem. At the beginning, when
\alpha and \psi are introduced, they are not explained well. Actually,
their explanation is so bad that it hinder the comprehension of the
whole analysis reported later. Particularly, the sentence "To decide
whether ... should abort or not, we use a threshold \psi, that
determines the length percentage of s_i below which s_i will abort due
to s_j. This percentage is denoted \alpha_ij". What does this sentence
mean ? The plot in Figure 1 does not help either, because these curves
are not yet explained. Later, the function f() is introduced in
Equation (2), and it seems those plots were actually coming out of
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this function. However, this is absolutely badly explained. This all
part is critical for the understanding of the whole paper: if what
comes next is sound and consistent at all, its understanding is
undermined by the cloudy, imprecise and ununderstandable introduction
of the critical quantities \psi, \alpha and f().

Other unclear things throughout the paper:
- when W_ij is introduced in III, it is defined as "workload" without
  any further explanation. So, what do the authors mean by "workload" ?
- what are the exact assumptions under which Equation (3) in Claim 1
  holds ? If a transaction s_j interferes with s_i, why can't it interfere
  more than 1 time throughout s_i execution ? For example, a higher priority
  task with a period lower than the length of the transaction of a lower
  priority task, would manage to conflict with the same transaction while
  it is being re-executed after abortion, so to interfere multiple times.
  Where are the assumptions that make this scenario impossible ?
- the definition of \alpha_min and \alpha_max is at least as impossible
  to understand as the one of \psi and \alpha themselves.

Submission #0056 Overall Value: 3 Expertise: medium Reviewed As: REGULAR

General Information

Submission Id: 0056
Submission Title: **Length-based Contention Management: Increasing Schedulability of Real-Time Software with STM Concurrency Control**

Reviewer: 9199977
Reviewer's expertise: medium

Submitted as: regular paper/presentation

Form A (for programme committee only)

Ratings: n.a. not applicable 1 extremely poor, grossly substandard 2 poor, substandard
3 average, standard 4 good, above standard 5 outstanding, way above standard

Overall Value: 3

Best Paper Award Candidate: no

Comments for the committee:

Form B (returned to authors)

In conference scope? yes
Interactive presentation (IP) candidate? no
Paper exceeds 6 pages? no

Presentation (n.a. = not applicable, 1 = extremely poor, 5 = outstanding):
Accuracy of title: 4
Clarity of abstract: 4
Problem clearly defined: 4
Methods, algorithms, and proofs clearly described: 3
Experiments and results clearly described: 4
Clarity of tables and figures: 4
Overall Presentation (maybe different from average): 3

Content (n.a. = not applicable, 1 = extremely poor, 5 = outstanding):
Novelty of solution: 4
Thoroughness and depth of theory: 4
Hardness of experimental evidence: 4
Account of prior work (references): 4
Overall Content (maybe different from average): 4

Comments for the author:

This paper proposes a novel contention manager for resolving transactional
conflicts. The authors identify the conditions under which LCM is superior to
previous real-time CMs, and show that LCM can achieve higher schedulability
than retry-loop lock-free synchronization for G-EDF systems. However, the
work is only analytical, and the authors do not provide experimental
evaluations.
There are many mathematical formulations in this paper, and more explanations
should be added.

This paper is well written. While there are some errors in this paper.
1. Page 3: “So, we have the following cases:-“ delete –;

2. What is the meaning of]0,∞[.

Submission #0056 Overall Value: 4 Expertise: medium Reviewed As: REGULAR

General Information

Submission Id: 0056
Submission Title: **Length-based Contention Management: Increasing Schedulability of Real-Time Software with STM Concurrency Control**

Reviewer: 0979978

Reviewer: 0979978
Reviewer's expertise: medium

Submitted as: regular paper/presentation

Form A (for programme committee only)

Ratings: n.a. not applicable 1 extremely poor, grossly substandard 2 poor, substandard
3 average, standard 4 good, above standard 5 outstanding, way above standard

Overall Value: 4

Best Paper Award Candidate: no

Comments for the committee:

Form B (returned to authors)

In conference scope? yes
Interactive presentation (IP) candidate? no
Paper exceeds 6 pages? no

Presentation (n.a. = not applicable, 1 = extremely poor, 5 = outstanding):
Accuracy of title: 5
Clarity of abstract: 4
Problem clearly defined: 4
Methods, algorithms, and proofs clearly described: 4
Experiments and results clearly described: 2
Clarity of tables and figures: 3
Overall Presentation (maybe different from average): 4

Content (n.a. = not applicable, 1 = extremely poor, 5 = outstanding):
Novelty of solution: 4
Thoroughness and depth of theory: 3
Hardness of experimental evidence: 2
Account of prior work (references): 4
Overall Content (maybe different from average): 4

Comments for the author:

```
This paper proposes a contention management scheme LCM (Length-based
Contention Manager) which
considers the length of the atomic sections as well as tasks' priorities for
STM (software transactional
memory). It shows that LCM can reduce the retry costs and response times
compared to previous
contention managers in analytical methods.
However, the followings can improve the completeness of the paper:

1. No experimental results are given in the paper. Although the authors insist
that the problem is
analytically solved, additional experimental results can make the paper more
convincing.

2. In Section 3, too many notations are introduced all in a breath. It is very
hard to follow the concepts.

3. In Section 4, it will be much better if you can describe the intuition
behind LCM before getting into
the details.
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Submission #0056 Overall Value: 3 Expertise: medium Reviewed As: REGULAR

General Information

Submission Id: 0056
Submission Title: **Length-based Contention Management: Increasing Schedulability of Real-Time Software with STM Concurrency Control**

Reviewer: 4479974
Reviewer's expertise: medium

Submitted as: regular paper/presentation

Form A (for programme committee only)

Ratings: n.a. not applicable 1 extremely poor, grossly substandard 2 poor, substandard
3 average, standard 4 good, above standard 5 outstanding, way above standard

Overall Value: 3

Best Paper Award Candidate: no

Comments for the committee:

Form B (returned to authors)

In conference scope? yes
Interactive presentation (IP) candidate? no
Paper exceeds 6 pages? no

Presentation (n.a. = not applicable, 1 = extremely poor, 5 = outstanding):
Accuracy of title: 5
Clarity of abstract: 5
Problem clearly defined: 5
Methods, algorithms, and proofs clearly described: 3
Experiments and results clearly described: 2
Clarity of tables and figures: 3
Overall Presentation (maybe different from average): 3

Content (n.a. = not applicable, 1 = extremely poor, 5 = outstanding):

Novelty of solution: 3
Thoroughness and depth of theory: 4
Hardness of experimental evidence: n.a.
Account of prior work (references): 4
Overall Content (maybe different from average): 3

Comments for the author:

```
The paper proposes a novel contention manager for transactional memory
conflicts in the context of multiprocessor real-time systems. It
provides upper bounds on transactional retries and response times when
used with fixed and dynamic priority schedulers.

The novelty of the proposed contention manager is that it allows for
priority inversion in the context of atomic sections. Specifically,
when a lower priority job executing an atomic section is interrupted
by a higher priority job, the lower priority job will be allowed to
continue executing depending on a combination of two factors: the
relative length of the atomic sections of the two jobs and how close
the lower priority job is to completing the atomic section.

The paper compares the schedulability and response time of their
contention manager against two other CMs and lock-free
synchronization, showing that their approach performs better.

The topic of transactional memory for real-time systems seems
promising and the results presented here are novel and advance the
state of knowledge of the field. Further, I could not find any bugs in
the proofs provided.

The authors make the point from the start that their work is
analytical and hence no experimental evaluation will be provided. This
is fine, however, the authors should be able to provide some intuition
about the quality of the bounds provided in claims 6 and 7. In my
opinion, such a discussion, even if it would be premature, would
improve the quality of the paper.

The work in this paper builds upon the work provided in [5].
Specifically, some proofs and the evaluation of the work is based on
the results obtained in [5]. However, [5] does not seem to be
published or peer-reviewed. Hence, structuring the evaluation around
the work in [5] and building upon the results [5] is in my opinion the
biggest weakness of the paper.

Typos and low-level comments:
abstract: are analytical, so our results.
page 1: apporach -> approach
page 3: LCM is not a central CMs -> LCM is not a central CM
page 3: is allowed abort -> is allowed to abort
page 3: its number of atomic section -> its number of atomic sections
page 4: alpha^hl_max is alpha value -> alpha^hl_max is the alpha value

The paragraph with title "LCM notations" in page 2 could be omitted.

In page 4, I am not familiar with the notation used for expressing
beta^ih_1 and beta^i_2.


In the proof Claim 2: the claim follows from a reasoning similar to
the proof of Claim 1; however the text in the proof of Claim 2 should
be rephrased as the claim itself doesn't follow from Claim 1.

The url given for citation [5]
http://portal.acm.org/citation.cfm?id=956418.956614 links to a
different paper with title "Multiprocessor EDF and Deadline Monotonic
Schedulability Analysis".
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Submission #0064 Overall Value: 3 Expertise: high Reviewed As: REGULAR

General Information

Submission Id: 0064
Submission Title: **On-line Scheduling of Target Sensitive Periodic Tasks with the Gravitational Task Model**

Reviewer: 4879995
Reviewer's expertise: high

Submitted as: regular paper/presentation

Form A (for programme committee only)