On the Convolution Efficiency for Probabilistic Analysis of Real-Time Systems (Artifact)

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Abstract

This artifact describes the process for validation and reproduction of the experiments given in the associated paper "On the Convolution Efficiency for Probabilistic Analysis of Real-Time Systems". This document contains the information on the scope of the presented artifact, i.e. what are the considered experiments, instructions for obtaining the source code of the experiments, tested platforms, and other relevant information.

2012 ACM Subject Classification Mathematics of computing → Probabilistic algorithms; Computer systems organization → Real-time system specification

Keywords and phrases Probabilistic analysis, Random variables, Algorithm Complexity

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Related Article Filip Marković, Alessandro Vittorio Papadopoulos, and Thomas Nolte, "On the Convolution Efficiency for Probabilistic Analysis of Real-Time Systems", in 33rd Euromicro Conference on Real-Time Systems (ECRTS 2021), LIPIcs, Vol. 196, pp. 16:1–16:22, 2021.
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1 Scope

The artifact provides the source code that was developed for performing the experiments that are described in the related article. In more detail, the source code mainly corresponds to Section 5 of the related article, where the three main experiments are described:

- Evaluation of the down-sampling algorithms (Subsection 5.1),
- Evaluation of the convolution algorithms (Subsection 5.2), and
- Computation of the deadline miss probability (Subsection 5.3).

Results of the above experiments are presented in the related article by Figure 4, Figure 5, and Figure 6, respectively.

2 Content

The artifact package includes:

- `Artifact_Evaluation_instructions.pdf`: a document that provides instructions for obtaining the necessary tools, and performing the experiments described in the related article.
- `/source code`: a directory that contains the source code of the performed experiments, together with the `README` and the `LICENSE` files.

3 Getting the artifact

The artifact endorsed by the Artifact Evaluation Committee is available free of charge on the Dagstuhl Research Online Publication Server (DROPS). In addition, the artifact is also available at: `https://github.com/Aeoliphile/Artifact-Evaluation--On-the-convolution-efficiency`.

4 Tested platforms

The artifact is known to work under OSX, Windows, and Linux operating systems. We also tested its use on several hardware configurations, using dual-core Celeron CPU, dual-core Intel i5, hexa-core Intel i7, and quad-core Intel i7 CPUs. RAM memory ranged from 4GB until 32 GB. The artifact should work on any system that supports:

- MATLAB computing platform (version R2020b or higher), and
- Advanpix Multiprecision Toolbox [1].

5 License

The artifact is available under the MIT licence.

6 MD5 sum of the artifact

d6f1a279ef34b1e4e0b3ce49968b2901

7 Size of the artifact

592 KB

References

1 Advanpix LLC. Multiprecision computing toolbox for MATLAB. Version 4.8.3.14470. URL: `http://www.advanpix.com/`.