



Special issue on real-time scheduling on heterogeneous platforms

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Published online: 16 May 2022

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This special issue features an emergent topic in the domain of real-time scheduling: how to schedule and analyze complex real-time tasks on heterogeneous hardware architectures. In particular, the current issue features two papers:

- Exploring AMD GPU Scheduling Details by Experimenting With “Worst Practices”, by Nathan Otterness and James H. Anderson.
- Feasibility Analysis for HPC-DAG Tasks, by Sanjoy Baruah

The first paper by Nathan Otterness and James H. Anderson addresses the problem of characterizing the behavior of complex hardware architectures like AMD GPUs. Such architectures are increasingly used for implementing modern real-time applications for e.g. autonomous driving. It is therefore very important to be able to precisely model the characteristics of these architectures in order to analyze their schedulability.

The second paper by Sanjoy Baruah concerns the schedulability of the HPC-DAG task model. Such model has been conceived to specify applications executing on heterogeneous multicore architectures consisting of several types of processors such as classical processors, GPUs, etc. The paper discusses the complexity of determining the feasibility of a set of tasks specified according to the HPC-DAG model.

Preliminary versions of these two papers were presented at the “29th International Conference on Real-Time Networks and Systems”, which was held virtually on April 7–9 2021. The presentations raised a lot of interest from the audience and produced much discussion. The two papers received the “Best Paper Award” and the “Outstanding Paper Award”, respectively, and the authors were successively invited to submit extended version to this special issue.

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The papers presented in this issue just present a glimpse into future applications of real-time research. We hope that this issue will further catalyze the research and development in this important and exciting area, and we hope the readers will benefit from this selection of papers.

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