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## Improved hard real-time scheduling and transformations for embedded Streaming Applications

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**Author:** Spasic, J.

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# STELLINGEN

Propositions belonging to the Ph.D. dissertation:

## **Improved Hard Real-Time Scheduling and Transformations for Embedded Streaming Applications**

by Jelena Spasić

1. An application modeled as an acyclic Cyclo-Static Dataflow (CSDF) graph can be scheduled as a set of real-time periodic tasks containing as many tasks as the number of execution phases of an actor in the graph by using any scheduling algorithm that preserves the ordering of phases for each actor. (This dissertation, Chapter 3)
2. Considering a different Worst-Case Execution Time (WCET) value for each execution phase of an actor when converting an acyclic CSDF graph to real-time tasks leads to higher application throughput and better processor utilization. (This dissertation, Chapter 3)
3. By doing fine-grain dataflow analysis, an application modeled as a Synchronous Data Flow (SDF) graph can be efficiently transformed by task replication into an input-output equivalent CSDF graph to better match the execution platform and meet throughput requirements. (This dissertation, Chapter 4)
4. Application tasks replication and the voltage-frequency scaling capability of a cluster heterogeneous multiprocessor platform lead to an energy-efficient design of embedded real-time streaming systems. (This dissertation, Chapter 5)
5. An accurate energy model of an embedded streaming system should be built upon a more expressive application model and real measurements of the system energy consumption. (This dissertation, Chapter 6)
6. Apart from investigating unsolved problems, researchers should spend the same amount of time reassessing solutions of solved problems.
7. Not only should a manuscript of a research paper be accessible to the research community. If possible, an implementation of the research solution and experimental data should be provided as well.
8. A good embedded systems designer should be equally good in designing embedded systems and in documenting his/her work.
9. Making assumptions in solving research problems helps. The same does not hold in human communication.
10. Unearned advantage of men over women cannot be reduced by introducing gender-related quotas. This creates just another unearned advantage.