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Leiden
The Netherlands

System-level design methodology for streaming multi-processor embedded systems

Nikolov, H.N.

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Propositions (Stellingen)

by Hristo Nikolov Nikolov, author of

System-Level Design Methodology for Streaming Multi-Processor Embedded Systems

1. Model-driven, platform-based design at system level of design abstraction is the right approach to master the ever growing complexity of Multiprocessor Embedded Systems-on-Chip. *(This dissertation)*
2. Designing at system level of abstraction opens an implementation gap in the design flow which can be closed systematically and in an automated way by exploiting the properties of the models used to capture application and platform features. *(This dissertation)*
3. Connecting processing components through communication controllers and communication memories in MPSoCs executing data-streaming applications (KPNs) is efficient in terms of HW resource utilization and achieved performance speed-up. *(This dissertation)*
4. The performance of an MPSoC executing a data-streaming application is determined by the slowest component of the system. *(This dissertation)*
5. The obtained results by using the DAEDALUS design flow are as good as the components in the IP component library. *(This dissertation)*
6. Utilizing the FPGA on-chip memory resources is crucial for prototyping high-performance MPSoCs. At the same time, the amount of on-chip memory is the main limitation on the number of processing components of an MPSoC that can fit on a single FPGA. *(This dissertation)*
7. In the multi-core era, optimizing the sequential execution is still very important and researchers should seek methods of speeding sequential execution.
8. Intrinsic knowledge about the target application and platform domains can lead to highly optimized and efficient hand-crafted MPSoC implementations. Design automation can only go that far.
9. One day on Mars takes 24.6 Earth hours and one year on Mars takes 687 Earth days, i.e., 1.88 Earth years. Therefore, being a Ph.D. student on Mars could be much more effective than being a Ph.D. student on Earth. Since the student would have 1.88× more time (compared to the students on Earth) for conducting the research, writing papers and the thesis itself, better quality of the results might be expected.
10. A researcher always needs one experiment more, one day more, and one page more to write a perfect paper.
11. It does not matter whether the experiment section of a research article reports several frames per second or one frame per several seconds; the chance to get the article accepted for publication increases with citing the proper related work.
12. With DAEDALUS, we create a virtual link between our design methodology and the ancient Greek mythodology. The human eye and brain are “lazy”, tending to predict rather to read a text completely. If the reader has noticed the strange word “mythodology” in the previous sentence, then he/she is not a “lazy reader”.