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Structured Parallel Programming on multi-core wireless sensor networks

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Wireless sensor network (WSN) platforms are now experiencing the same evolution of high performance computing (HPC) when it evolved from singlecore to multi-core architectures. Multi-core sensor platforms are expected to grow, especially in application domains that require complex processing of the sensed data, such as those that require image processing, data encryption, network coding, data fusion etc.

The shift from single-core to multi-core sensor platforms also affects the WSN programming models. In fact, it introduces the need of high level abstractions to support parallel and distributed programming and models in WSN. This fact has recently suggested the adoption in WSN of methodologies such as skeletons that are largely used in the programming of parallel and distributed systems.

Our work addresses the use of skeletons in the context of WSN, with the particular attention to multi-core sensors. In particular, leveraging on the fact that some meaningful WSN applications are characterised by known programming patterns (for example, in visual sensor networks, the stencil skeleton fits well object tracking applications), we aim at defining suitable models of computation for the most promising skeletons for WSN, and at combining the concepts of structured parallel programming and real-time sensing.

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