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## Automatic Software Tuning of Parallel Programs for Energy-Aware Executions

Sebastien Varrette, Frederic Pinel, Emmanuel Kieffer, Pascal Bouvry  
University of Luxembourg, Luxembourg  
{sebastien.varrette, Frederic.Pinel, Emmanuel.Kieffer}@uni.lu  
pascal.bouvry@uni.lu

For large scale systems, such as data centers, energy efficiency has proven to be the key for reducing all kind of costs related to capital, operational expenses and environmental impact. Power drainage of a system is closely related to the type and characteristics of workload that the device is running. This paper aims at proposing an automatic software tuning method for parallel program generation able to better exploit hardware features available on a target computing system such as an HPC facility or a cloud system. We propose a search based approach combining both exact and approximation search methods among an ever-increasing number of tunable code transformation and execution options (such as the number of OpenMP threads and/or the CPU frequency settings) to guarantee that at least a local optimum is reached for any application.

**Keywords:** Automatic Software Tuning, LLVM, Multi-objective Optimization.