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**QUANTUM-INSPIRED HYPER-HEURISTICS FOR ENERGY-AWARE SCHEDULING ON HETEROGENEOUS COMPUTING SYSTEMS**

**ABSTRACT**

Power and performance tradeoff optimization is one of the most significant issues on heterogeneous multiprocessor or multicomputer systems (HMCSs) with dynamically variable voltage. In this paper, the problem is defined as energy-constrained performance optimization and performance-constrained energy optimization. Task scheduling for precedence-constrained parallel applications represented by a directed acyclic graph (DAG) in HMCSs is an NP-HARD problem. Over the last three decades, several task scheduling techniques have been developed for energy-aware scheduling. However, it is impossible for a single task scheduling technique to outperform all other techniques for all types of applications and situations. Motivated by these observations, hyperheuristic framework is introduced. Moreover, a quantum-inspired high-level learning strategy is proposed to improve the performance of this framework. Meanwhile, a fast solution evaluation technique is designed to reduce the computational burden for each iteration step. Experimental results show that the fast solution evaluation technique can improve average algorithm search speed by 38 percent and that the proposed algorithm generally exhibits outstanding convergence performance.