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ENERGY-EFFICIENT SCHEDULING FOR SMALL PERVASIVE COMPUTING DEVICES UNDER FIXED-PRIORITY MULTI-SUBTASK MODEL

ZHIGANG GAO[1,2], ZHAOHUI WU[1], AND MAN LIN[3]

[1]*College of Computer Science*
Zhejiang University,
Hangzhou, Zhejiang, P.R. China, 310027
e-mail: {gaozhigang, wzh}@zju.edu.cn

[2]*College of Computer Science*
Hangzhou Dianzi University,
Hangzhou, Zhejiang, P.R. China, 310018
e-mail: gaozhigang@hdu.edu.cn

[3]*Department of Mathematics, Statistics and Computer Science*
St. Francis Xavier University
Antigonish, NS, B2G2W5, Canada
e-mail: mlin@stfx.ca

ABSTRACT—In a pervasive computing environment, energy is one of the critical restriction factors of embedded devices. Dynamic voltage scaling (DVS) has been proven to be an effective method for reducing energy consumption of processors. This paper proposes an energy-saving algorithm under the fixed priority multi-subtask model. This algorithm includes two parts: first, it exploits the relationship among tasks to set the slowdown factors of subtasks; second, it dynamically reclaims and reuses the slack time of precedent subtasks during the execution of tasks. Experimental results show this method can reduce energy consumption effectively while guaranteeing the real-time requirements of systems.

Key Words: Pervasive computing, real-time systems, DVS, slowdown factors, slack reuse.