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面向实时数字信号系统关键链路延时的NoC映射方法研究

陈庚生; 陈亦欧; 胡剑浩*

电子科技大学通信抗干扰技术国家级重点实验室 成都 610054

A Novel Critical Delay-Aware Mapping Method for Real-Time Digital Signal Systems with NoC Platform

Chen Geng-sheng; Chen Yi-ou; Hu Jian-hao*

National Key Laboratory of Science and Technology on Communications,
the University of Electronic Science and Technology of China, Chengdu 610054, China

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摘要 该文在面向功耗优化的经典NoC设计平台和映射算法基础上，针对实时数字信号处理电路固有的实时性特征，提出了一种新的面向最小化系统关键链路延时的NoC自主映射模型MM-Map。该模型在满足处理单元处理容限和链路带宽的约束下，采用基本遗传算法完成延时目标的优化求解。实验结果表明，该模型能节约一定硬件资源的消耗，得到近似全局最优延时解，映射过程简单，收敛效果好。

关键词：　数字信号处理　关键链路延时　NoC映射　遗传算法

Abstract：Based on energy-aware mapping algorithm for NoC regular architectures, a new method, MM-Map is proposed, which can automatically map a circuit of real–time digital signal processing system onto the NoC platform with the minimum critical delay for the system in this paper. The MM-Map platform uses generic algorithm to optimize the delay-aware objective which can satisfy the specified constrains such as limitation of processing units and link bandwidth of NoC. The simulation results show that the new method can reduce the hardware cost and achieve an approximate global optimum with a simple procedure and good convergence.

Keywords：Digital signal processing　Critical delay　NoC mapping　Generic Algorithm(GA)

通讯作者：陈庚生

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