

三操作数的前导1预测算法纠错编码模块的设计与实现

王京京¹, 富坤¹, 程婷婷¹, 魏思捷¹, 耿跃华²

(¹河北工业大学 计算机科学与软件学院, 天津 300401; ²河北工业大学 电气工程学院, 天津 300130)

摘要: 针对三操作数预测算法中的预测误差, 提出了纠错方案. 依据前导1预测的流程以及预编码规则, 设计了纠错模块的预编码规则, 完成了其整体结构设计, 采用硬件描述语言VHDL进行编程, 并通过Quartus II进行仿真验证, 得到了相应的RTL级电路, 最后对仿真结果进行了分析. 仿真结果表明, 设计完成的算法结构能够有效地完成前导1预测纠错的功能.
关键词: 前导1预测算法; 纠错编码模块; FPGA; VHDL; Quartus II

Algorithmic Design and Implementation of A Three-Operand

Leading-one Prediction Error-Correcting Code Module

WANG Jing-jing¹, FU Kun¹, CHENG Ting-ting¹, WEI Si-jie¹, GENG Yao-hua²

(¹ School of Computer Science and Engineering, Hebei University of Technology, Tianjin 400401, China;

² School of Electrical Engineering, Hebei University of Technology, Tianjin 300401, China)

Abstract: In this paper, we propose an error correction scheme based on the prediction error of the three operation number prediction algorithm. According to the process of leading-one prediction and pre-encoding rules, designing a error-correcting module pre-encoding, and completing the overall structure of the error-correcting module, using hardware description language VHDL to program some function module to optimize the design process, and use Quartus II tools to perform comprehensive validation, received the RTL-level hardware circuits, and last the results are analyzed and verified. Simulation results show that the designed algorithm structure can effectively complete the Leading-one prediction correcting function.

Key words: leading-one prediction; error-correcting code module; FPGA; VerilogHDL; Quartus II

作者简介:

王京京 女, (1990-), 硕士研究生. 研究方向为计算机智能控制、电子设计自动化.

富坤(通讯作者) 女, (1979-), 博士, 讲师. 研究方向为可重构计算、计算机系统结构. E-mail: fukun@hebut.edu.cn.