

论文

基于平台的可配置计算及其在自动目标识别中的应用

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摘要:

可配置计算思想的提出已有40多年的历史, 国外学者在近十年来取得了实质性的研究成果, 但该技术在国内的研究才刚刚起步。本文介绍了可配置计算技术的发展历程、国内外研究现状以及两种主要的研究思路—基于专用芯片和基于平台的研究思路, 并对比了两种研究思路各自的优势。我们重点关注基于平台的研究思路, 介绍了可配置计算的基本原理, 分析了可配置计算系统的结构模型与计算模型, 并提出未来基于平台的可配置计算结构应该是多个带有嵌入式处理器的FPGA以高速串行接口互联的拓扑结构。最后我们着重介绍了可配置计算在国内外自动目标识别(ATR)领域的研究成果和关键技术, 并指出未来可配置计算技术在ATR领域的应用。

关键词: 可配置计算 自动目标识别 片上系统 基于平台的设计 基于FPGA的设计

Overview of Platform-based configurable Computing and Application on Auto-Target-Recognition

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Abstract:

The theory of Configurable Computing was proposed forty years ago. Foreign scholars has achieved some substantial results in the past decade, however the research in China has just begun. This article describes firstly the history of configurable computing technology, research progress at home and abroad, and the two mainly research methods which are respectively chip-based and platform-based. In this paper, the platform-based research approach is focused on because it is more suitable for automatic target recognition(ATR) than the chip-based method. Then the basic principle of the configuration is introduced, and the configurable computing system architecture model and the calculation model are analyzed. It is also predicated that the topology of the platform-based configurable computing architecture in the future should be a structure of multiple FPGA with embedded processor which interconnect with each other by high-speed serial interfaces. Finally, the application of Configurable Computing technology in the fields of ATR is mainly discussed which is based on the international research results and key technologies of ATR.

Keywords: Configurable Computing Automatic Target Recognition System on Chip(SoC) Platform-based Design FPGA-based design

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