夜视技术

DMA在高速红外图像实时处理系统中的应用

王会峰[1,2],汪大宝[2],刘上乾[2]

1.西安工业大学光电工程学院，西安　710032;
2.西安电子科技大学技术物理学院，西安　710071

摘要　　针对某红外成像定位系统对红外序列图像处理和诸如图像去噪、非均匀性校正、图像自适应分割、图像测量、数模解算等算法的实时性能要求，提出采用DSP DMA（存储器直接访问）方式处理系统中的转移和大量交换高效方案。以AD21062和EP1C6组成的数字图像处理系统为例，介绍DMA操作在高速红外实时图像处理系统中的应用，并给出具体的设计。实验表明，该设计方案可以使DSP从大量的数据搬移操作中解脱出来，专门的图像处理算法操作能够有效地提高数字图像处理系统的实时性，解决了系统的瓶颈问题。

关键词　　红外图像　数字信号处理器　可编程逻辑器件　存储器直接访问

分类号　TN21

Application of DMA in high-speed infrared image real-time processing

WANG Hui-feng[1,2], WANG Da-bao[2],LIU Shang-qian[2]

1. School of Photoelectricity, Xidian Technological University, Xi'an 710032, China;
2. School of Technology Physics, Xidian University, Xi'an 710071, China

Abstract In order to meet the real-time processing requirement for the infrared sequential image processing and some algorithms such as image denoising, non-uniformity correction, image adaptive dissection, image measurement and mathematic model resolving in a specific infrared imaging position system, an effective scheme for transferring and exchanging infrared image data by DSP DMA is proposed. The application of DMA operation in the high-speed infrared real-time image processing system is introduced through a digital image processing system composed of AD21D62 and EP1C6. The experiment results show that the scheme can free DSP from the transmission of mass data, the customized image processing algorithm can effectively improve the real-time performance of digital image processing system and overcome the bottleneck problem existing in the system.

Key words infrared digital image　DSP　FPGA　DMA

通讯作者　王会峰 conques8888@126.com

扩展功能

本文信息

- Supporting info
- PDF(272KB)
- [HTML全文](0KB)
- 参考文献

服务与反馈

- 把本文推荐给朋友
- 加入我的书架
- 加入引用管理器
- 复制索引
- Email Alert
- 文章反馈
- 浏览反馈信息

相关信息

- 本刊中 包含"红外图像"的相关文章
- 本文作者相关文章
- 王会峰
- 汪大宝
- 刘上乾