

液晶与显示 2013, 28(5) 764-769 ISSN: CN:

本期目录 | 下期目录 | 过刊浏览 | 高级检索

[打印本页] [关闭]

器件驱动与控制

基于TMS320DM8168的SOC高清视频处理系统的设计与实现

杨振永^{1,2}, 王延杰¹, 孙海江¹, 丁南南¹, 李静宇^{1,2}

1. 中国科学院 长春光学精密机械与物理研究所, 吉林 长春 130033;
2. 中国科学院大学, 北京 100049

摘要：为了满足人们对视频处理系统高清、便携和远程可操作的需求,文章设计并实现了一个高清视频处理系统,它以TMS320DM8168 SOC为核心,将HD-SDI高清视频的采集、处理、压缩、存储、显示和千兆网络传输等功能集成为一体。文章对系统的硬件结构进行了简单介绍,对系统软件中的驱动程序部分进行了详细的介绍分析,并以相邻帧差法为例,使用本系统实现了对30帧频1 920×1 080高清视频中运动物体的检测,并且对系统的性能进行了全方位的测试。测试结果表明,本系统作为单片系统,不仅满足了视频处理系统高清、便携、可远程操作的要求,而且具有设计简单、扩展性好、处理能力强、算法可重构等优点。

关键词：TMS320DM8168 SOC HDVPSS HD-SDI 帧差法

Design and Implementation of SOC High Definition Video Processing System Based on TMS320DM8168

YANG Zhen-yong^{1,2}, WANG Yan-jie¹, SUN Hai-jiang¹, DING Nan-nan¹, LI Jing-yu^{1,2}

1. Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences, Changchun 130033, China;
2. University of Chinese Academy of Sciences, Beijing 100049, China

Abstract: In order to meet the requirement of high definition, portability and remote operation of the video processing system, a high definition video processing system based on TMS320DM8168 SOC is designed and implemented. With the system, the HD-SDI video can be captured, compressed, stored in the hard disk, displayed on LCD and transmitted via the network. The paper gives a brief introduction on the hardware structure. The embedded drivers are explained in detail. In order to test the system performance, the frame difference, which is used to detect moving objects, is implemented on the system. The results show that the SOC system not only has met the requirement of high definition, portability and remote operation, but also has the advantage of simple design, good expansibility and flexibility, strong processing ability and reconfigurable operation arithmetic.

Keywords: TMS320DM8168 SOC HDVPSS HD-SDI frame difference

收稿日期 2012-12-24 修回日期 2013-04-16 网络版发布日期

基金项目:

国家863计划(No.2012AA7031010B)

通讯作者: 王延杰, E-mail: wyjciomp@sohu.com

作者简介: 杨振永(1988-),男,河南濮阳人,硕士研究生,主要研究嵌入式图像处理系统。

作者Email: wyjciomp@sohu.com

参考文献:

- [1] 张秋林,夏靖波,邱婧,等. 基于ARM和FPGA的双路远程视频监控系统设计 [J]. 液晶与显示, 2011,26(6):780-784. [2] Texas Instruments Incorporated. TMS320DM816x DaVinci Video Processors[EB/OL].[2011-10-11].<http://www.ti.com/lit/ds/symlink/tms320dm8168.pdf>. [3] 张伽伟,周安栋,罗勇. ARM11嵌入式系统Linux下LCD的驱动设计 [J]. 液晶与显示, 2011,26(5):660-664. [4] Talla D,Golston J. Using davinci technology for digital video devices [J]. *Computer*,2007,40(10):53-61. [5] 刘晓军. 采用HD-SDI的高清视频采集卡的设计与实现 [J]. 电视技术, 2009,(1):91-93. [6] Texas Instruments Incorporated. DM814x EZ 5.04.00 Software Developers Guide[EB/OL].[2011-4-8].http://processors.wiki.ti.com/index.php/DM814x_EZ_5.04.00_Software_Developers_Guide. [7] Texas Instruments Incorporated. DM816X AM389X VPSS Video Driver User Guide PSP 04.00.00.12[EB/OL].[2011-4-24].<http://processors.wiki.ti.com/index.php?oldid=79736>. [8] Liu Y,Yu H,Zhang P. The implementation of embedded image acquisition based on V4L2[C]//2011 International Conference on Electronics, Communications and Control, Ningbo:ICECC, 2011:549-552. [9] 秦岭,王煜坚,李东新,等.视频编码标准H.264的主要技术特点及其应用前景 [J]. 微计算机应用, 2004,25(4):449-455. [10] Texas Instruments Incorporated. H.264 Encoder on HDVICP2 and Media Controller Based Platform User's Guide[EB/OL].[2011-5-14]. http://e2e.ti.com/cfs-file.ashx/___key/CommunityServer-Discussions-Components-Files/717/4540.H264_5F00_Encoder_5F00_HDVICP2_5F00_UserGuide.pdf. [11] 宋宝华. Linux设备驱动开发详解 [M].北京:人民邮电出版社,2008,276-313:387-418. [12] 吕国亮,赵曙光,赵俊.基于三帧差分法和连通性检验的图像运动目标检测新方法 [J]. 液晶与显示, 2007,22(1):87-93.

本刊中的类似文章

1. 杨振永.基于TMS320DM8168 的SOC高清视频处理系统的设计与实现[J]. 液晶与显示, (): 0-0