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摘要: 针对传统直方图均衡化算法对对比度增强容易过于强烈的缺点,提出了一种基于对比度有效控制的快速图像增强算法,首先统计直方图分布,计算平均亮度,然后采用自适应方法调整直方图分布,最后计算灰度转换公式,得到新灰度值。结合实际情况,以高性能DSP芯片TMS320C6455作为中央处理器,结合现场可编程门阵列FPGA构成外围电路逻辑控制,搭建了嵌入式高速图像增强处理平台。基于该实验图像验证了文章提出的算法,实验结果表明,本系统增强图像整体画面自然,局部对比度明显,有效地防止了过度增强对比度带来的违和较好的增强效果,同时算法处理简单,运算迅速,能够满足工程项目的要求。

关键词: 图像增强 嵌入式系统 对比度 直方图均衡化

Design and Realization of Airborne Embedded Image Enhancement System

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Abstract: According to the disadvantage of too strongly contrast enhancement of traditional histogram equalization algorithm, a new image enhancement algorithm based on effective control of contrast was presented. First, the statistical histogram distribution and the average brightness were calculated. Then the histogram distribution adjusted by the adaptive method. Finally the converting formula is calculated and the new bright values were obtained. An embedded high speed image enhancement processing system on high performance DSP TMS320C6455 and FPGA was designed. Experimental results with real images showed that the system can naturally enhance image, the local contrast of the image is perfect, and the excessive sense of violation is prevented, and the process is simple, the running speed of the program is fast, so it can meet the requirements in the project.

Keywords: image enhancement embedded system contrast histogram equalization

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