

液晶与显示 2014, 29(1) 28-33 ISSN: CN:

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器件物理及器件制备技术

液晶显示全局动态调光算法的高效实现方法研究

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摘要：动态调光算法包括背光值和液晶像素补偿量确定。通过查表法实现的基于图像分类的S曲线调光算法电路存在资源消耗大、处理速度慢等缺陷。本文提出了2种算法实现方式：等差数列法、最小二乘拟合法，并分别对这2种算法进行了仿真分析，得到其与查找法的最大标准差分别为1.8和0.8。在开发的全局调光液晶电视样机上进行了实际测试，和查表法得到的像素亮度相比：等差数列法的误差为3个灰度级，最小二乘法的误差在1个灰度级以内。2种算法都可使电路存储资源的利用率由原查表法的71%降低到4%。仿真和实验结果表明最小二乘法具有更好的效果。

关键词：动态调光 S曲线 像素补偿 实现方法

Efficient hardware implementations for global dimming in LCDs

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Abstract: The dynamic dimming algorithm consists of two steps: dimming level determination and LC pixel compensation. Look-up-table method is applied in S-curve dimming algorithm based on image classification. In order to solve the shortcomings of large consumption of hardware resources and slow processing speed of this algorithm, this paper proposes two kinds of algorithm implementations: Arithmetic Sequence Method (ASM) and Least-squares Fitting Method (LSFM). The simulation results show that the largest standard deviation is 1.8 and 0.8 of ASM and LSFM, respectively. The practical tests have done on the LCD TV prototype. Compared to the luminance of pixels from look-up table method, the deviation of ASM is less than 3 graylevels and the deviation of LSFM is less than 1 gray-level. The hardware storage resource decreases from 71% of the proposed methods to 4% of look-up-table. The simulation and experimental results show that LSFM is better.

Keywords: dynamic dimming S-curve pixel compensation algorithm implementation

收稿日期 2013-06-17 修回日期 2013-06-26 网络版发布日期

基金项目:

安徽省2012科技计划资助项目 (No.1206c0805007)

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