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Liquid Crystal Display (LCDs) with Light Emitting Diode (LED) backlight is a very popular display technology, used for instance in television sets, monitors and mobile phones. This paper presents a new backlight dimming algorithm that exploits the characteristics of the target image, such as the local histograms and the average pixel intensity of each backlight segment, to reduce the power consumption of the backlight and enhance image quality. The local histogram of the pixels within each backlight segment is calculated and, based on this average, an adaptive quantile value is extracted. A classification into three classes based on the average luminance value is performed and, depending on the image luminance class, the extracted information on the local histogram determines the corresponding backlight value. The proposed method has been applied on two modeled screens: one with a high resolution direct-lit backlight, and the other screen with 16 edge-lit backlight segments placed in two columns and eight rows. We have compared the proposed algorithm against several known backlight dimming algorithms by simulations; and the results show that the proposed algorithm provides better trade-off between power consumption and image quality preservation than the other algorithms representing the state of the art among feature based backlight algorithms. © (2013) COPYRIGHT Society of Photo-Optical Instrumentation Engineers (SPIE). Downloading of the abstract is permitted for personal use only.

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