Controlling Power Consumption for Displays With Backlight Dimming - DTU Orbit
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Backlight dimming of Liquid Crystal Displays (LCD) is a technology which aims at saving power and improving visual quality. The evolution of energy standards and the increasing public expectations regarding power consumption have made it necessary for backlight systems to manage their power. Such a control is challenging to implement, because for LCD displays quality and power are closely interlinked, and one cannot be modified without affecting the other. To address this issue, we present a framework for power controlled backlight dimming defining some key concepts. Two methods to obtain backlights with a predefined power level for images are presented: one method has low complexity and the other achieves high performance in terms of quality/power trade-off. Those methods are evaluated on a modeled Light-Emitting Diode edge-lit backlight display. The high-performance method performs significantly better than other algorithms from the literature, when considering both calculated power and quality. This high-performance method is then extended to video in three modes. The first mode favors high quality in a power-aware manner and allow significant power variations, the second mode has strict power constraints and the third one provides a trade-off between the other two.

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