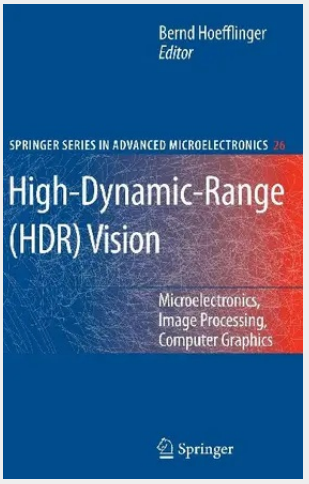
Hoefflinger

High-Dynamic-Range (HDR) Vision

Microelectronics, Image Processing, Computer Graphics



Creating high-fidelity images of our world has been a continuous challenge, even as our understanding and skills have evolved. The acquisition and mapping of the rich and complex content of visual information rank high among the most demanding technical tasks. Now electronic image sensors can record a dynamic range from bright to dark of more than seven orders of magnitude, thus exceeding the ability of a human eye by more than a hundred times and displaying five orders of magnitude in brightness, resulting in CRT and LCD displays with more than 100-fold improvement. This first comprehensive account of high-dynamic-range (HDR) vision focusses on HDR real-time, high-speed digital video recording and also systematically presents HDR video transmission and display. The power of the eye-like, logarithmic optoelectronic conversion concept is demonstrated in machine-vision, medical, automotive, surveillance and cinematic applications, and it is extended to HDR sub-retinal implants for the vision impaired. While the book conveys the overall picture of HDR vision, specific knowledge of microelectronics and image processing is not required. It provides a quantitative summary of the major issues to allow the assessment of the state of the art and a glimpse at future developments. Selected experts share their know-how and expectations in this rapidly evolving art related to the single most powerful of our senses.

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